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ORIGINAL ARTICLES

CANCER*

BY ROBERT B. GREENOUGH, M.D., F.A.C.S.†

THE medical profession as a whole is inclined to feel a high degree of pessimism in regard to cancer. The practising physician is fully aware of the lack of success which has attended all of the attempts to demonstrate a specific bacterial or other cause for the disease. He views its gradual but steady increase in the mortality statistics with a helpless and hopeless feeling, and he judges from the reports of the most progressive clinics, that the end-results of present day methods of treatment are very, very disappointing. That these conditions do exist, and that they warrant some degree of pessimism cannot be denied; but this is far from being the whole story. More has been learned about cancer in the past twenty-five years than in any other period of medical history; great advances have been made in its treatment, both by radical surgery, and by the newer agencies of radiation and electro-coagulation; and more effective methods of employing these agents are being developed every day. What is more, the attitude of mind, both that of the medical profession and that of the public has changed. No longer is cancer a word to be shunned and evaded. Cancer is recognized as a disease to be discussed, diagnosed and given treatment like any other disease, and indeed in many instances with far greater prospect of relief than many of the other diseases of advancing years. It is probable that no small part of the increasing death rate from cancer is due to the fact that so many deaths from the other more readily controlled diseases have been eliminated, and thus a greater number of persons attain the age when cancer occurs than ever did before. Life Insurance statistics indicate that an average of eight years has been added to human life in the last twenty-five years, and this has raised the expectation of life from forty-nine to fifty-seven, just the period in which cancer is most likely to attain its greatest harvest.

Innumerable attempts have been made to determine a bacterial or protozoan organism as a cause for cancer, but up to the present time none has been found which could be accepted by the scientific world as capable of producing the disease. The most recent development along this line is the ingenious hypothesis advanced by Dr. W. E. Gye, of London, which is based upon the idea that an ultra-microscopic organism combined with a specific chemical factor is involved in the production of the peculiar tumor of fowls, known as the Rous sarcoma. This tumor, unlike cancer as it is seen in other situations, can be transmitted by material passed through a Berkefeld filter and apparently without the direct transfer from one animal to another of whole tumor cells. Dr. Gye's experiments have roused the greatest interest throughout the scientific world, and many attempts have been made to repeat his work, but as yet without complete and positive confirmation. It is very probable that from this work further light may be shed upon the problem of malignant disease, but it must be remembered that the Rous tumor is one which is notably different from human tumors, and the direct application of this theory to the human cancer problem is at present quite unjustified.

In spite of the fact that no specific cause for cancer has been as yet established, many interesting and important facts, have been discovered in regard to the disease in the past few years. By means of experimental work with animals, including spontaneous and inoculated tumors, facts in regard to heredity and to immunity have been established that throw light upon the cancer process. It appears from Maud Slye's experiments that the soil in which the tumor grows or from which it springs, may be influenced enormously by inherited characteristics. Yet even in mice bred to be most suspectible to cancer some additional factor, such as trauma or chronic irritation, is usually necessary before a tumor will develop. Again Miss Jones has shown in the Huntington Laboratories that a race of mice 100% immune to the engrafting of a particular tumor can have this immunity broken down in some 15% of cases by the mere addition to the engrafted tumor of a foreign body. These facts encourage us to think that the cause of cancer may be not one but many different things,

*Read at a Meeting of the Rochester Medical Association, Rochester, N. Y., April 4, 1928.

†For record and address of author see "This Week's Issue," page 524.

and that the disease represents a peculiar method of reaction of those body tissues to external influences which are by inheritance or for any other cause most prone to undergo this change.

In this connection we must remember that cancer can be produced artificially in animals and indeed unintentionally in man by agents of three entirely different characters, chemical, physical and organic. As a chemical agent coal tar is the best example. After long exposure to the irritation of coal tar productive changes in the epithelium occur, which in time progress to cancer. In man this process requires from ten to twenty years; in animals a much shorter period, but one corresponding in proportion to the life span of the individual. As a physical agent X-ray is well recognized to be able to produce cancer, and in man again the time duration is one of years. It is to these changes that we owe the death of practically all of the early practitioners of radiology, and again the pathological manifestations are progressive, beginning with non-malignant proliferations such as keratoses and papillomas, and culminating in metastasizing cancer only after the lapse of many years.

Examples of the origin of cancer from an organic irritant are less frequent, but the disease occurs in man in the bladder as a result of infestation with the worm, Bilharzia, and in animals from infection with a worm found in cockroaches (Febiger) or with the cat tape-worm (Wood). Again in this instance a considerable period of irritation and inflammation precedes the actual development of the malignant tumor.

The one common factor in these three different forms of artificially produced cancer appears to be that of long continued but not lethal damage to the tissue cells exposed to the irritant agent. Next to reproduction of the species, the ability to repair damaged tissues is probably one of the most important, widespread and powerful functions in biology. Were this not the case few plants or animals would survive to maturity to carry on their race. It is this function which appears to be involved in all of the so-called "pre-cancerous" proliferations such as are observed in artificially produced cancer, and it is only after a long continuance of activity of this normal and conservative process that the arbitrary border line of cancer is passed, and the process becomes malignant. This is a reasonable view of the operation of chronic irritation in the production of cancer, and additional facts to support this idea have been developed in the past few years.

Many years ago von Hansemann coined the terms of "anaplasia" and "anaplastic" to indicate the manner in which cancer cells differed in their growth from normal tissue. By anaplasia was meant an enhanced rapidity of growth combined with a loss of functional differentiation. More recently Broders, of the Mayo Clinic has attempted successfully to classify tumors of different sorts, from their histological appearances; to estimate the degree of loss of functional differentiation, and to check the results with the known end results of treatment. This was first done with squamous cell carcinoma of the external skin and lip, but has now been extended to include the tongue and cervix, and it has even been applied also to carcinoma of glandular origin, such as cancer of the breast and of the rectum. In a series of cases of breast cancer, which I studied myself, the specimens were classified without knowledge of the end-results. Three degrees of malignancy were recognized, high, low and medium. The data were then assembled and it was found that in the low malignancy class 68% were alive and well at the end of three years. The medium class gave 33% alive and well, but those of high malignancy (as judged from the histology alone and with no consideration of other factors such as the extent of the disease) showed not a single case alive and well at the end of the three year follow up. These observations have been confirmed by others, and we may feel that facts of great importance in prognosis can be gathered from such a study of the slides of the original tumor.

The significance of these facts in connection with the production of artificial cancer, however, is the matter that concerns us here. It was shown that the pre-cancerous proliferation produced by tar resulted in an over-growth of the damaged cells; with the production of keratoses and papillomas; in other words, disturbed or abnormal function. We now see that this same change continues all along the line, beyond the border line of cancer and even up to those forms of cancer, which we regard as most malignant. The arbitrary criterion which we employ to separate cancer from non-malignant disease is the presence of cells infiltrating the deeper tissues in situations where such cells cannot normally occur. It is quite possible that the real dividing line between cancer and non-cancerous diseases lies somewhere else than at the point we arbitrarily attempt to place it. Every pathologist knows that there are a certain number of tumors on the border-line between cancer and non-cancerous processes; in which a positive decision from the microscopic specimen is an impossibility. This perhaps is one of the best arguments against a specific parasite as a cause for cancer, and undoubtedly favors the view that it is instead a biological process, a peculiar form of growth of the previously normal body cells.

Other of the new facts which have been established in regard to cancer are in accordance with this idea. Thus the important observations of Warburg, that cancer cells have the ability to convert glucose into lactic acid in the presence of oxygen to an extent some twenty times greater than normal cells, indicates a physiological

change in the cell metabolism of a magnitude commensurate with its increased power of growth. Whether this is a primary or a secondary change is not determined, but it is not unreasonable to think that the change in the cell metabolism contributes materially to the excessive power of growth of the cancer cell. Burrowes believes that the vitamines play an important part in this extraordinary power of growth, and here again we do not know whether some special vitamine balance is a prerequisite to cancer growth or whether the changed metabolism of the cancer cell consumes or employs vitamines in a manner impossible for normal cells. It is a well established fact, however, that deprivation of fat-soluble vitamine A produces the disease of Xerophthalmia in rats, in which a degree of epithelial proliferation with abnormal keratinization occurs of such extent as to equal that observed in many of the so-called pre-cancerous proliferations. Xerophthalmia, however, is a relatively acute process and usually causes the death of the animal unless the diet is corrected; I have never heard of its going on to the actual production of cancer.

Such is a brief sketch of the situation today as regards the nature and cause of cancer, and upon these facts we must construct our policy as regards its treatment. Failing a specific cause we can expect neither a specific diagnostic test nor a specific curative serum. As a matter of prevention, undoubtedly, removal of the cause during the stage of pre-cancerous proliferation may be expected to prevent the disease. This can be done for instance with experimental tar-cancer, if the tar irritation is stopped during the stage of papillomatous dermatitis. Once cancer has occurred, however, it goes on of its own momentum whether the irritant continues or not. Prevention can also be accomplished in human beings by the correction of conditions which by experience we know are forerunners of cancer in its many situations. I refer to the diseases such as leukoplakia and kraurosis, X-ray Dermatitis, lacerations of the uterine cervix, ill-fitting tooth plates, and many of the benign tumors and diseases which are recognized as of possible pre-cancerous significance.

For the treatment of established cancer, however, we are forced back on the rather crude methods which have been developed during the past 50 years for the total destruction or removal of the disease. These methods are surgery (including cauterization) and radiation. By these methods cancer can be cured, but the percentage of all cases of cancer that *are* cured today is a lamentably small one. At a hospital like the Massachusetts General our figures show only about 15% of all cases of cancer of the breast free of disease at the end of the five year following-up period; and only about 10% of all cases of cancer of the uterine cervix. The explanation for these poor results, however, is not far to seek. Less than 50% of the cases of cancer of all kinds that enter the wards of the Massachusetts General Hospital arrive there sufficiently early in the course of their disease to permit even an attempt at radical operation. Many are too advanced for any operation, others permit only some palliative measures, while those upon whom an attempt at radical cure is made include far too many cases of the "forlorn hope" type, in which the surgeon's better judgment gives way to his compassion, and he attempts the impossible in the vain hope that conditions may be not so bad as the symptoms indicate.

In spite of this gloomy picture, however, surgery and radiation are capable of curing the disease when they can be applied in early and favorable cases. The same facts are true of most remedial measures. The advanced and moribund case of diphtheria is not cured by anti-toxin, nor is the wide-spread general septic-peritonitis often cured by surgery. The main difference is that the advanced case of diphtheria or of peritonitis is obviously seriously sick while the advanced cancer case may show but little external evidence of the wide extent of the disease.

In the early and favorable cases of breast cancer at the Massachusetts General Hospital; those cases in which the disease is still local in the breast and has not as yet involved the axillary lymph-nodes; we obtain about 70% of cases well at the end of five years, and in the same way with cancer of the cervix, if we take only the cases in which the disease has not extended beyond its point of origin, 50% are cured.

The percentage of possibility of cure varies of course with the situation of the organ involved for it depends to a great extent upon the anatomical situation of the tumor, its accessibility and the importance to life of the organs and tissues which lie adjacent to it, and thus permit or prevent the wide removal with a safe margin of surrounding tissue which is the essential feature of radical surgical treatment. Undoubtedly in the present stage of surgical science the successful operative treatment of cancer of the oesophagus and of the pancreas is thus limited nearly to the vanishing point; although cancer of the stomach and intestine is treated by operation successfully in early and favorable cases. In any case, however, the "spread" between the actual cures (15% in cancer of the breast) and the possible cures (70%) which can be accomplished even with our present resources is far too great. To put it in another way, five times as many cases of cancer as are now cured by surgery and radiation can be cured, if only the treatment can be applied in time. Dr. Janet Lane-Claypon, an English student of this subject, has well said "It must not be forgotten that every advanced case of cancer was once an early case". It is these facts that justify the attempts that are now being so widely made to

educate the public, and the medical profession as well, to a better appreciation of the importance of delay in the treatment of cancer. Both are undoubtedly at fault, and both are all too ready to temporize. In a series of cases of cancer of the breast at the Massachusetts General Hospital, we found an average delay, from the time the patient noticed her first symptoms until the operation, of 7½ months. The average delay on the part of the patient before seeking medical advice was 6 months. The time consumed by the physician in making a diagnosis was 2 weeks, and the remainder of the time was consumed in getting the patient in to the hospital and in the necessary preparations for the operation. On the other hand, in a series of cases of cancer of the cervix studied by Leland at the Huntington Hospital (not yet published) he was able to show a falling off of prospective cure, of 16% for each month of delay in obtaining treatment. Cancer is not commonly regarded as an acute disease, and indeed takes years in many cases to run its course, but a disease which advances so rapidly in the early stages as to diminish the patient's chance of cure 4% a week, is indeed acute, and a delay of 7½ months must be admitted to be evidence of neglect or disregard of the established facts by the patient or by his physician or, too frequently, by both.

So far as the public is concerned, much has already been accomplished by such agencies as the American Society for the Control of Cancer, our National, State and Municipal Public Health Departments, the magazines and especially the daily press. The public has been educated to a better understanding of the cancer problem, many of the erroneous ideas about the disease have been corrected and the laity has been taught to appreciate that the first steps in the treatment of cancer must be taken by the patient himself, by promptly consulting his medical advisor for symptoms which are in any way suggestive of the possibility of cancer, such as the presence of a lump or an ulceration which is slow to heal, or the abnormal discharge of blood from any of the body cavities. Much undoubtedly remains to be done in this direction. The periodic health examination, for instance, promises to aid in the early discovery of many cases of cancer, but the situation in any case is far more satisfactory than it was 10 years ago.

The education of the medical profession, however, is another story and indeed the difficulties encountered by the general practitioner deserve our greatest sympathy. The advanced and inoperable case of cancer presents text book symptoms which are unmistakable, but the early case may well defy the diagnostic abilities of the most experienced and require an exploratory operation conducted with all of the precautions necessary to protect the patient's possibility of cure. The remedy would seem to be to emphasize to the medical profession as to the public, the possible "cancer significance" of such symptoms as have been detailed above; and at the same time, to provide in one way or another adequate accessible expert consultation service, free or not as the case may require, which may be called upon in the doubtful case.

In addition to the institutions devoted entirely to cancer in the larger medical centers, cancer clinics and tumor clinics are being organized in many of our larger general hospitals, precisely to meet this situation. The truth is that cancer is no longer a one-man job. The adequate diagnosis and treatment of cancer requires today a whole group of men working in coöperation and supplied with all of the material equipment of a general hospital including radium and X-ray. The internist, the pathologist, the chemist and the physicist are just as necessary in this group as are the radiologist, the surgeon and the representatives of the specialties, such as genito-urinary surgery and nose and throat. Only by some such organization can we hope to make available the best of modern treatment to the patient in the early stages of the disease.

An attempt to supply service of this nature has been made in Massachusetts under the Department of Public Health. We have a state cancer hospital of about 90 beds equipped with adequate personnel and facilities for the treatment of cancer in all stages of the disease. In close co-operation with this central institution, we have organized in established general hospitals in a dozen different cities throughout the state, special cancer clinics for the diagnosis and treatment of early cases. This is a comparatively new field of activity for a public health department, but the results of the first eight months experience indicate that a real want is being supplied.

When it comes to the treatment of early cases, whether by surgery or by radiation, it is to be feared that every patient does not today receive the best that medicine can afford. Radical operations for the cure of cancer in its various situations have been developed in the course of years, so that they are virtually standardized. Such operations are based first upon the anatomical relations of the part involved, and secondly upon the natural history of the disease as it occurs in that particular situation, especially with reference to its lines of extension beyond the primary growth. There is, however, a wide difference between the standard radical operation as practiced in the better clinics, and the operations that are commonly performed by surgeons throughout the country even in the early and favorable cases. 33% of the cases of cancer of the breast which come to the Huntington Hospital with recurrence after operation are found on examination to have been subjected to a primary operation in an attempt at cure which falls short of the recognized radical operation for can-

cer of the breast. It is astonishing, it seems to me, that such can be the fact, for especially in cases of cancer of the breast the standard operation involving the removal of the breast with all the skin over it, the pectoral muscles, the entire axillary contents and the deep fascia of the chest wall from clavicle to epigastrium and from sternum to Latissimus, is or should be a matter of common surgical knowledge. It is difficult to comprehend the mental attitude of a surgeon who performs any operation short of the standard operation in an early and favorable case of cancer of the breast, and thus deprives his patient of the opportunity for cure to which she is entitled by reason of the advances that have been made in surgical treatment.

With regard to radiation also it must be admitted that there is room for improvement both in the technique of the application of radium and X-ray, and to a far greater extent in the judgment employed in the selection of cases suitable for treatment by these agents. Time and space will not permit a detailed, discussion of these points, but to anyone who deals with cancer cases in their later stages it is all too frequently made evident that the treatment obtained by the cancer patient during the early and favorable stages of the disease falls short of the best that could be given even at the present time.

The value of the colloidal metals, copper, gold and especially and more recently, lead, in the treatment of cancer is still under discussion. Conflicting reports are obtained from many sources, and at the present moment one can only say that the value of these methods is open to considerable doubt and their use is attended by dangers which can not at present be entirely avoided.

To summarize the burden of this communication, it may be said:

The deaths from cancer are increasing year by year. No specific cause or remedy for the disease has yet been discovered. With our present methods of treatment, surgery and radiation, cures *can* be obtained in early and favorable cases. If all cases could be given treatment in the early and favorable stage of the disease some *five times as many cures* of cancer could be obtained as are obtained today. To obtain this end the public and the medical profession must be taught that in its early stages cancer is essentially an acute disease, but one which is in many cases amenable to cure by prompt, radical and efficient treatment by surgery or by radiation.

CANCER STUDIES IN MASSACHUSETTS. 2. HABITS, CHARACTERISTICS AND ENVIRONMENT OF INDIVIDUALS WITH AND WITHOUT CANCER

BY HERBERT L. LOMBARD, M.D., AND CARL R. DOERING, M.D.* †

AT the inception of the Massachusetts program for cancer control Dr. Frederick Hoffman was consulted for suggestions. He advised that the Massachusetts study should include a collection of questionnaires similar to those that he was collecting in his San Francisco Survey[1]. As Dr. Hoffman is probably the greatest collector of figures of our time, any advice from him should be most seriously considered. A few of these questionnaires were obtained in the 1925 study[2] but as the number was too small for tabulation they were given to Dr. Hoffman to incorporate with his other records.

During 1927 a somewhat similar study was made by this Department, with the assistance of several of the visiting nurses' organizations throughout the State. Our method of approach was somewhat different from that of Dr. Hoffman. We feel that any study of the habits of individuals with cancer is of little value without a similar study of individuals without cancer. To know that a large percentage of patients with cancer have certain habits is of little value for inference unless we know what percentage of the community at large has the same habits.

In the laboratory it may be fairly easy to obtain animals which may be used as controls, but in dealing with the human species this is an entirely different problem.

METHODS:—Our controls were obtained by having the same investigator who collected the record of the patients with cancer fill out a similar record for an individual without cancer, of the same sex and approximately the same age. In a few cases it was necessary for a different investigator to obtain a control.

The following information was obtained:

Name Address
Sex Age Race Conjugal state
Birthplace of individual Of father Of mother
No. of children Height Weight
Average amount of exercise before illness
Length of intimate association with cancer patients
Foods eaten prior to illness:
Meat, Sugar, Starches, Canned goods, Green vegetables, Other vegetables, Milk products, Coffee, Tea, Salt
Use of tobacco
Use of alcohol
Use of laxatives
Housing conditions
Economic status
Chronic past illness
Type of cancer

These items are intended to cover most of the present hypotheses regarding the causation of cancer.

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†For record and address of author see "This Week's Issue," page 524.

We obtained records from 217 cancer patients and a similar number of controls. While the number is small, it is felt to be sufficiently large to make a preliminary statement of our findings. Sometimes large differences will show up in small samples, and only such differences are of value in a program of cancer control.

EVALUATION OF SAMPLE:—The groups contain 55 males and 162 females. The sex ratio of 34 males to 100 females is less than that found in the cancer mortality records, 65 males to 100 females, and the clinic attendance of 80 males to 100 females. This difference probably means that many men with cancer are cared for by their wives, but when the women are affected the visiting nursing associations are employed. The average age of the cancer patient is 59.2 ± .9 years, and the standard deviation is 12.9. The controls have an average age of 59.5 ± .8 years, and the standard deviation is 12.2. The slight difference in ages is due to the difficulty of getting controls of exactly the same age as the cancer cases, but these differences are insignificant.

The two groups are practically identical regarding the economic status of the individual, although there are fewer cancer cases among the well to do, as shown in Table 1.

TABLE 1

ECONOMIC STATUS

	Poor	Moderate	Well to do	Unknown
Cancer group	35	172	7	3
Control group	45	151	18	3

TABLE 2

	Semitic	Black	Others	Unknown
Cancer group	29	5	177	6
Control group	28	3	186	0

In respect to race, there is little difference between the cancerous and the controls.

When the two groups are compared by country of birth of individuals, the native born are in excess of the foreign born, but the difference is within the limit of chance fluctuation. When we consider the country of birth of the father and mother we find the differences are greater. In a previous paper[3] we found that cancer was more prevalent among the foreign born and children of foreign born than among the children of native parents. In selecting the controls it is most difficult to get individuals whose parents are born in the same countries as those of the cancer patients. Our cancer group, therefore, has more individuals with foreign parents than the control group.

In Table 4 a comparison of the two groups relative to the conjugal state shows that there are more single females among the control group than among the cancer group. In order to determine if this difference was due to our sample, the female deaths from cancer in the State were compared by conjugal state with our sample, with the resulting figure of 16.2 per cent. for the State and 13.6 per cent. for the sample. The cancer group evidently has too few single females, and the control group has too many, as several of the nurses used themselves as controls.

TABLE 4

CONJUGAL STATE

	Cancer group			Control group		
	M.	F.	T.	M.	F.	T.
Single	7	22	29	6	41	47
Married	30	86	116	37	71	108
Widowed	17	50	67	9	47	56
Divorced	1	1	2	2	1	3
Separated	0	3	3	0	2	2
Unknown	0	0	0	1	0	1

In order to determine how representative our sample of cancer cases was in respect to type, comparison has been made on a percentage basis

TABLE 3

NATIVITY

	Birthplace of Individual		Birthplace of Father		Birthplace of Mother	
	Cancer group	Control group	Cancer group	Control group	Cancer group	Control group
United States	86	103	40	65	37	63
Ireland	42	38	71	57	71	58
Russia-Poland	14	14	15	17	14	15
Italy	6	4	6	5	6	5
England, Scotland, Wales	24	18	24	23	27	25
Germany, Austria, Holland, Belgium	5	3	7	8	6	8
Norway, Denmark, Sweden	4	4	6	6	5	5
Greece, Spain, Portugal, France	0	1	0	2	0	0
Canada (French)	15	6	18	6	20	7
Canada (Others)	16	20	22	21	23	24
Lithuania, Finland	0	2	0	2	0	2
All others	5	4	8	5	8	5

with the types found in the Massachusetts Hospitals, in the death returns, and in the State-aided cancer clinics. It is impossible to arrive at a precise figure. The death returns do not include the cures. The hospital admissions do not account for the many patients remaining at home. The volume of the clinic cases is too small on which to base judgment.

Table 5 shows the various distributions.

TABLE 5

PERCENTAGE DISTRIBUTION OF CANCER CASES BY TYPE

Type	Nurses' Questionnaires	Cancer admissions to hospitals	State-aided clinics	Deaths
Buccal cavity	13.8	9.6	22.6	5.6
Stomach group	18.9	17.2	2.5	31.4
Intestinal group	14.7	12.9	4.8	18.2
Female genitals	21.6	20.4	13.4	13.9
Skin	2.3	2.6	30.2	2.1
Male genitals	1.4	3.5	1.6	3.4
Breast	20.7	16.3	19.1	10.8
Other organs	5.1	14.6	1.6	12.2
Unspecified	1.4	2.8	4.1	2.4

The above discussion of comparisons of the cancer and control groups emphasizes the difficulties of getting satisfactory controls. We believe, however, they are as good as can be obtained, but as we realize their inadequacy, we have arrived at conclusions only after due consideration of the known differences between the groups.

COMPARISON OF CANCER AND CONTROL GROUPS:—The contagion theory was studied by comparing the two groups in respect to the previous association with cancer patients. Table 6 shows that there is no relationship.

TABLE 6

ASSOCIATION WITH CANCER PATIENTS

	None or slight	Association	Unknown
Cancer group	146	19	52
Control group	154	29	34

The work of several laboratory investigators shows convincing evidence in favor of the hereditable predisposition to develop cancer. There is also a slight amount of evidence from human material[4]. We have attempted to measure the difference between the cancer and the control groups regarding heredity in Table 7, but we realize that social as well as genetic differences may be thus depicted. Forty-one per cent. of those with negative heredity history of cancer in more distant relative fall in the cancer group, while we should expect fifty per cent. Also it is noticeable that sixty-one per cent. of the "unknowns" fall in the cancer group. Both these differences are highly significant statistically. The difference between the two groups with respect to positive heredity history is not significant. No inference can be made unless we know how the unknowns would be distributed if they were known. We found that there was a considerably larger percentage of foreign born among the unknowns of the cancer group, and assuming that the foreign born person in the cancer age cannot well remember or perhaps never knew the causes of death of his more distant relatives, it is reasonable to expect that some of the unknowns at least would have a positive history. Therefore, we feel that there may have been a relationship shown in the following table if we had all of the information. This applies almost equally well to the heredity history in the immediate family.

TABLE 7

HEREDITY

	Cancer Group		Control Group	
	Cancer in immediate family	Cancer in more distant relatives	Cancer in immediate family	Cancer in more distant relatives
Present	26	23	24	14
Absent	121	96	151	140
Unknown	70	98	42	63

Housing conditions were used to measure the parasitic theory. It is believed that cockroaches and other vermin, possible carriers of parasites, would be more prevalent where the housing conditions were poor, than where they were good. Table 8 shows no connection between cancer and housing.

TABLE 8

HOUSING CONDITIONS

	Good	Bad	Unknown
Cancer group	157	51	9
Control group	158	55	4

Constipation has been considered a possible cause of cancer[5]. The users of laxatives have been studied to measure any possible connection between constipation and cancer. Table 9 shows no significant difference between the two groups.

TABLE 9

USE OF LAXATIVES

	Users	Non-users	Unknown
Cancer group	185	22	10
Control group	180	28	9

The female cancers for all types by the number of children are compared with cancers of the female genitals and cancers of the breast in Table 10. The findings are not statistically significant, probably because of the small figures, but the results are consistent with those of the Health Section of the League of Nations[6]. They found that cancer of the uterus is more prevalent and cancer of the breast less prevalent among women who have borne children than among those who had not. Seventy-five per cent. of our total group have borne children while seventy-seven per cent. of those with cancer of the female genitals and seventy-two per cent. of those with cancer of the breast had children.

TABLE 10

CANCERS AMONG FEMALES BY THE NUMBER OF CHILDREN

	Total cancers	Female genitals	Breast
No children	40	11	12
One child	20	8	6
Over one child	98	28	25
Unknown	4	0	3

The possible relationship between exercise and cancer is measured in Table 11, and found to be significant.

TABLE 11

EXERCISE BEFORE ILLNESS

	Great	Moderate	Little	Unknown
Cancer group	64	120	26	7
Control group	57	118	25	17

Height and weight are both studied and while height shows no significance there was a tendency among the cancer group to be underweight. This difference may be due to the probability that the nurses classified their patients by the present weight rather than the normal weight before illness.

TABLE 12

HEIGHT

	Short	Medium	Tall	Unknown
Cancer group	37	142	38	0
Control group	32	131	51	3

TABLE 13

WEIGHT

	Slim	Medium	Stout	Very stout	Unknown
Cancer group	70	96	42	9	0
Control group	36	118	54	6	3

Chronic past illnesses were studied to determine if any relationship existed between them and cancer. The only significant difference between the cancer cases and the controls appears in the chronic diseases of the teeth in males. This disease is over three times as prevalent among the cancer group as among the control group and is statistically significant, as forty per cent. of the male patients with cancer had bad teeth and only eleven per cent. of the controls. Among the females thirteen per cent. of the cancerous patients and twenty per cent. of the controls had bad teeth. A check was made of this sample by getting similar figures from the clinic cases[12]. The cancer group was here compared with a control group so selected from those attending the clinics with no evidence of cancer as to make the two groups similar in respect to age and sex. We found 9.2 per cent. of the males with cancer, 3.6 per cent. of the male controls, 4.6 per cent. of the females with cancer and 1.7 per cent. of the female controls had bad teeth. The figures for males are consistent with those given in Table 14 but are only on the border line of significance. The females differ from those in Table 14 as they have a higher percentage of bad teeth in the cancer group. The difference, however, is insignificant. There are a smaller number of individuals with bad teeth among the clinic cases than in the nurses' study. This difference is believed to be due to the better economic status of the individuals attending the State-aided Cancer Clinics.

TABLE 14

CHRONIC PAST ILLNESS BY SEX

	Cancer Group		Control Group	
	Male	Female	Male	Female
Stomach	17	60	14	54
Female genitals		30		12
Intestinal trouble	16	62	14	53
Breast		13		12
Nervous trouble	11	64	7	58
Skin	1	5	1	7
Lungs	3	2	3	7
Bladder	2	10	3	5
Heart	2	7	9	15
Teeth	22	21	6	33
None	7	25	12	22
Unknown	7	21	6	17

It might be thought that the excess of bad teeth in males might have some relation to the excess of cancer of the buccal cavity in males, but the sub-division of cancer by type among

TABLE 15

MALE CANCERS AND TEETH

	Bad teeth	Not bad teeth	Total
Buccal cavity cancers	7	10	17
All other cancers	15	23	38
Total	22	33	55
Per cent of buccal cavity cancers	31.8	30.3	30.9

males showed no relationship and therefore the bad teeth may be regarded as a source of toxicity affecting total cancer rather than a source of chronic irritation affecting the cancers of the mouth.

Various foods have been studied to determine if there was any relationship between their ingestion and cancer. Table 16 shows, with the exception of dry vegetables and tea and coffee, that the cancer cases ate less of the various articles of food than the controls. This probably is accounted for by the presence of the disease itself. In the continuation of this study we are seeking information on the foods eaten prior to illness, as in many cases the diet has changed after the inception of the disease.

TABLE 16

DIET

	Cancer Group			Control Group		
	Heavy	Occasional or never	Unknown	Heavy	Occasional or never	Unknown
Meat	139	48	30	162	42	13
Sugars	111	91	15	142	71	4
Starches	181	25	11	200	14	3
Canned goods	35	161	21	50	153	14
Green vegetables	125	75	17	147	68	2
Other vegetables	44	139	34	42	150	25
Milk products	176	27	14	196	20	1
Coffee, Tea	189	14	14	185	28	4

The ingestion of salt has been considered by several as predisposing to cancer[7 8]. Table 17 points to no relationship between salt and cancer.

TABLE 17

SALT

	Much	Moderate	Little	Unknown
Cancer group	35	127	39	16
Control group	42	110	56	9

The use of alcohol shows no relation with cancer. The unknowns, however, are so many that they might alter the conclusions.

The use of tobacco has long been considered a factor in the incidence of cancer of the buccal cavity. Dr. Hoffman gives the smoking habits of cancer patients by the site of the disease in his San Francisco Survey. We have realigned Dr. Hoffman's figures in preparing Table 19[9].

TABLE 19

PERCENT OF EXCESSIVE SMOKERS BY TYPE OF CANCER

	Percent	No. of cases
Cancer of the throat	54	13
Cancer of the intestines	100	5
Cancer of the pancreas	33	3
Cancer of the rectum	88	8
Cancer of the lung	100	5
Cancer of the bladder	60	10
Cancer of the lip	92	12
Cancer of the jaw	100	5
Cancer of the neck	83	6
Cancer of the cheek	100	12
Cancer of the oesophagus	77	13
Cancer of the prostate	100	9
Cancer of the tongue	100	7
Cancer of the stomach	82	39
Cancer of the leg	50	2
Sarcoma	73	15
Miscellaneous	60	20

If we postulate that only cancers of certain sites should be affected by heavy smoking, and that those of other sites should not be so affected, and that sarcoma also should not be influenced by tobacco smoking, we can then compare the sites supposed to be affected by smoking with the other two groups which now can be regarded somewhat as controls. These figures, however, give no light upon the relation of smoking to cancer in general. Including under "sites supposed to be affected by smoking" cancers of the lip, jaw, cheek and tongue, and under "sites

TABLE 20

CANCER SITES BY SMOKING

	Sites supposed to be affected by smoking	Sites not supposed to be affected by smoking	Sarcoma	Total
Heavy smokers	34	100	11	145
Not heavy smokers	1	34	4	39
Total	35	134	15	184
Per cent of heavy smokers	97.2	74.6	73.3	78.8

TABLE 18

ALCOHOL

	Temperate Use									Intemperate Use								
	Users			Non-users			Unknown			Users			Non-users			Unknown		
	M.	F.	T.	M.	F.	T.	M.	F.	T.	M.	F.	T.	M.	F.	T.	M.	F.	T.
Cancer group	33	30	63	12	109	121	10	23	33	10	2	12	24	125	149	21	35	56
Control group	35	36	71	16	106	122	4	20	24	6	0	6	35	135	170	14	27	41

not supposed to be affected by smoking" all other cancers, we show the results in Table 20.

Of all males who have cancer in the above sample 78.8 per cent. are heavy smokers. Dr. Hoffman found in his larger sample of 834 male patients[10] that 44.1 per cent. were heavy smokers. In our sample, 47.3 per cent. were found to be heavy smokers. What is the true percentage of heavy smokers among males with cancer? Evidently the sample quoted in Tables 18 and 19 is not representative of the cancer population. What is the percentage of heavy smokers in the general population? We do not know. Dublin, Fiske and Kopf[11], among 16,662 male policy holders in the Metropolitan Life Insurance Company, found 33.1 per cent. to be heavy smokers. In our control sample we found twenty per cent. heavy smokers and in our total group, including both cancers and controls, we found 33.7 per cent.

The difference between our control group and the cancer group in respect to heavy smoking is twenty-seven per cent. This is highly significant which suggests that heavy smoking has some relation to cancer in general. Of the heavy smoking group, pipe smoking seems to be the most important, as 73.1 per cent. of the heavy smokers in the cancer group are pipe smokers and 72.6 per cent. of the heavy smokers in the control group are pipe smokers.

TABLE 21

CANCER SITES BY SMOKING

	Sites supposed to be affected by smoking	Sites not supposed to be affected by smoking	Total
Heavy smokers	9	17	26
Not heavy smokers	8	21	29
Total	17	38	55
Per cent of heavy smokers	52.8	44.8	47.3

In Table 20 there is a difference of eighteen per cent. between the heavy smokers who had cancer of the buccal cavity and the total per cent. of heavy smokers. This is statistically significant and indicates that a small part of the buccal cavity cancers may be due to smoking. Table 21 prepared from our figures is consistent with Table 20, but it is not signficant, due probably to the small size.

Table 22 compares the cancer and control groups from the nurses' questionnaires by smoking habits and Table 23 shows the smoking habits of those individuals who had cancer of the buccal cavity. The relationship between cancer of the buccal cavity and smoking appears from our figures to be due to pipe smoking alone.

TABLE 23

BUCCAL CAVITY CANCERS BY USE OF TOBACCO

	Users	Non-users	Unknown
Pipe	16	9	5
Cigarette	5	12	13
Cigar	10	12	8
Chewing	6	14	10

The study is being continued, narrowing the field of inquiry to the amount of salt eaten, the amount of condiments, canned goods, foods ordinarily eaten prior to illness, constipation and tobacco. In the 1928 study, the classification of foods is broader than in the present one.

DISCUSSION:

Throughout the study the "Unknown" item has been the most unsatisfactory. Such conclusions as we have drawn are made on the assumption that the unknowns are distributed in the same ratio as the known items. This is the most probable inference but it is by no means assured. In those tables in which the unknowns differ markedly from the controls they could easily alter the findings.

It should also be noted that when any two groups are compared with respect to a large number of variables, the differences themselves will form a frequency distribution and some of the variables with statistical significance may thus be entirely due to chance. In order to determine whether or not there is real significance in a given instance it is necessary that additional samples be obtained.

CONCLUSIONS:

Variations in the habits of cancer patients cannot be studied without the use of good con-

TABLE 22

TOBACCO

	Cancer Group									Control Group								
	Users			Non-users			Unknown			Users			Non-users			Unknown		
	M.	F.	T.	M.	F.	T.	M.	F.	T.	M.	F.	T.	M.	F.	T.	M.	F.	T.
Pipe	38	1	39	11	124	135	6	37	43	27	1	28	25	137	162	3	24	27
Cigarette	11	1	12	21	126	147	23	35	58	9	4	13	38	134	172	8	24	32
Cigar	23	1	24	16	125	141	16	36	52	29	0	29	22	136	158	4	26	30
Chewing	13	0	13	22	126	148	19	37	56	12	1	13	35	134	169	8	27	35

trols, which are most difficult to obtain. We believe our sample to be as nearly satisfactory as is reasonably possible to get on a large scale.

As only large differences between controls and cancers need be considered the size of the sample is adequate.

The collection of data on cancer patients without similar data on controls is valueless in the determination of factors influencing the causation of cancer.

Bad teeth in males are more common among the cancer group than among the controls. This applies to cancer in general and is not limited to buccal cavity cancer.

Heavy smoking is more common in the cancer group than among the controls. In our sample heavy smoking was largely pipe smoking and was particularly more common in those individuals with cancer of the buccal cavity.

The figures gave a suggestion of a hereditary predisposition to cancer but the volume of unknowns made definite conclusions impossible.

The cancer group ate less than the controls but this probably is wholly due to the presence of the disease.

Although we realize that the figures in this study are too small and incomplete for significant conclusions to be drawn, they are presented to show the methods used in order that others may conduct similar studies. We feel that other independent samples collected in a like manner would do much to either prove or disprove our findings.

We wish to make acknowledgment to Dr. Frederick Hoffman for the suggestion which instigated this study; to Dr. John A. Nichols for his courtesy in allowing us to interview his patients at Tewksbury; to Miss Mary P. Cronin for collecting material at Tewksbury and editing all the questionnaires; to the following visiting nursing organizations for giving so freely of their time in collecting the data: Instructive Nursing Association, New Bedford; Lowell Visiting Nurse Association; Worcester Visiting Nurse Association; Brockton Visiting Nurse Association; Community Nursing Association, Boston; Hingham Visiting Nurse Association; District Nursing Association of Fall River; Newton Visiting Nurse Association; Fitchburg Visiting Nurse Association; and the Lynn Visiting Nurse Association.

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THE EARLY DIAGNOSIS OF CARCINOMA OF THE RECTUM

BY DANIEL FISKE JONES, M.D., F.A.C.S.*

THE diagnosis of carcinoma of the rectum is dependent upon an opportunity to see the patient, that is, there should never be an error in diagnosis after the physician has had an opportunity to examine the patient. Training of the laity to seek advice on the slightest suggestion of any change in bowel habit or sensation, or bleeding from the rectum is of the greatest importance. Training of the physician to make a digital and proctoscopic examination of the rectum is of equal importance. The training of one group and not the other would accomplish nothing. It is a fact that the only early symptoms are a change in bowel habit or sensation, and bleeding.

An early growth before it effects obstruction, should cause slight irritation and should cause slightly increased peristalsis or a sensation of some material still left in the rectum. Carcinoma of the bowel ulcerates early and therefore bleeding should be an early symptom. The usual text-book symptoms, which are late symptoms, are:

(1) *Constipation.* This symptom cannot be present until the growth blocks the intestine more or less. At the present time when mineral oil and cathartics are used to such an extent the time when this symptom makes an impression is much later than formerly. One must not only inquire about constipation but must ask about the increase in the dose of cathartics and as to whether the patient is taking mineral oil.

(2) *Constipation and Diarrhoea.* This is a text-book symptom which is rarely spoken of by the patient. Their idea is that they have frequent movements after constipation because they have taken cathartics. They rarely admit that they have a diarrhoea but do admit that they have from three to twenty discharges a day. They distinguish between frequent

*For record and address of author see "This Week's Issue," page 524.

small movements, or movements of pus, blood and mucous and diarrhoea. This is a late symptom.

(3) *Pain* is not a prominent symptom. There is a heavy aching feeling across the sacral region not infrequently, and in very late cases with metastases on the side of the pelvis there is pain down the sciatic. Occasionally there are attacks of lower abdominal pain due to obstruction, but the great majority of patients deny that they have abdominal pain. They frequently will admit that they have much rumbling of gas in the intestines, if they are asked.

(4) Loss of appetite comes on with increasing obstruction and loss of appetite causes

(5) *Loss of Weight.* Loss of weight is not due to the growth itself, as is shown by the fact that patients gain weight after a colostomy without removal of the growth.

(6) Any bleeding from the rectum is assumed by patients and by many physicians to be due to haemorrhoids, while as a matter of fact any bleeding from the rectum should be considered as due to carcinoma until it has been *proven* to be due to haemorrhoids. Before obstruction takes place, that is with lateral wall tumors, the stool is usually formed. The blood is, therefore, on the outside of the stool and will not give a positive chemical test for blood unless blood is on the part selected. After the bowel becomes obstructed, the stool is very soft or liquid, in which case blood becomes mixed with the stool and will give a positive chemical test. No blood will be found either by chemical tests or macroscopically in the narrow scirrhous type of growth.

(7) *Age.* It must be remembered that carcinoma of the colon and rectum may occur at any age. Many cases of carcinoma occur in cases twenty years old or even younger.

The above symptoms should be considered only as suggestive of carcinoma, and the diagnosis made by digital and proctoscopic examinations. The electric-lighted sigmoidoscope should always be used. No X-Ray examination should be made in suspected carcinoma of the rectum or colon until digital and proctoscopic examinations have been made and the rectum and lower portion of the sigmoid found to be normal. Carcinoma of the rectum is frequently missed by the X-Ray examination. Every effort should, therefore, be made to find the growth before one is put off the track by a negative X-Ray.

Early diagnosis is of the greatest importance as operation will undoubtedly cure many of these cases when operated upon early. The decision, as to whether the patient should be operated upon or not, should be made by the surgeon who has had experience in operating upon these cases.

CARCINOMA OF THE GASTRO-INTESTINAL TRACT

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THE fundamental natural history of carcinoma of the gastro-intestinal tract is precisely similar to that of carcinoma elsewhere. If our present concepts are correct, the disease starts invariably as a local process, a lawless multiplication of epithelial cells forming a tumor which, unless destroyed in some manner, possesses an indefinite power of growth. As it grows, it is locally invasive, that is, it encroaches upon the tissues of the organ in which it has started and destroys them by appropriating their blood supply and by pressure. This invasive proclivity extends indefinitely to every contiguous structure. In contrast to this progressive local growth, the tumor disseminates itself by the casting off of living cells which are carried by either the blood or lymph stream to distant parts of the body where each cell on finding a favorable environment may become the starting point of a new tumor exactly similar to its parent. A different type of dissemination may exist by the casting off of living tumor cells into the cavity of the viscus or into the peritoneal cavity, with subsequent implantation at some more or less remote point. The rate of growth of the parent tumor and of its metastases depends on many factors only some of which are understood or suspected; for instance, the younger and more vigorous the individual the more rapid is the growth of the tumor, presumably on account of the greater vigor of the tissues generally and the consequent rapidity of cell multiplication. Certain histological types of tumor cells appear to show greater rapidity of multiplication than others. Thus in general it may be said that cells of the embryonic type, low in the scale of differentiation, show greater vigor of growth than cells of more highly differentiated varieties. Needless to say, we are certain that there must be physio-chemical conditions which favor or oppose the growth of tumors, of which we have, as yet, little or no understanding.

Granted the correctness of this view of the origin of carcinoma, it follows that total local extirpation of the primary focus, before dissemination has occurred, will invariably cure carcinoma of the gastro-intestinal tract, and any

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respect in which the latter is unsuccessfully handled by surgical art must be chiefly due to inability or failure to attain this object. We know that a small epithelioma on the cutaneous surface of the body widely extirpated before dissemination has taken place should afford, in theory, a permanent cure in 100% of the cases. Experience has abundantly shown that carcinoma of the breast, attacked before demonstrable metastases have migrated to the regional lymph nodes, affords a five-year cure in from 70 to 75% of patients. Always in using the word "cure" in connection with carcinoma we deprecate its literal meaning because we realize that it is impossible to be certain that dissemination by the lymphatic or blood stream has not taken place and because we know that if this has occurred the secondary tumor in some distant part of the body may be extraordinarily slow in making its appearance.

Theoretically, we should expect exactly as good results in the treatment of carcinoma of the internal organs. Disregarding differences in growth rate due to the little understood peculiarities of the neoplastic cells themselves, it is evident that three things militate against our success:

First, the delay in diagnosis due to the concealment of the lesion by its deep situation;

Second, the frequent inability to perform an adequate excision on account of the impossibility of sacrificing too much of a vital organ or organs;

Third, the much greater liability to post-operative complications due to impairment of visceral function, the fear of which deters the surgeon from a very thorough operation and the occurrence of which may lead to a fatal issue.

The contrast in these respects between an external and internal neoplasm is very striking. In the case of a lesion anywhere on the cutaneous surface of the body or in the superficial structures like the mammary gland, diagnosis is likely to be early and a very radical and mutilating operation may be done without impairment of vital functions. The same disease in the alimentary tract, however, presents a far different problem. In the oral cavity, while diagnosis may be made comparatively early the field of excision must necessarily be small, and in the pharynx and oesophagus adequate excision is to all intents and purposes, incompatible with life. In the stomach and intestinal tract we are dealing with a condition midway between these two extremes. Diagnosis is likely to be much delayed but the possibility of radical removal of the lesion is considerable although the problem of regional lymphatic metastases is much more serious than in the case of the mammary gland; and also it must be admitted that the impairment of visceral functions attendant on the operation is the cause of a much higher mortality rate.

It cannot be too strongly insisted or too often repeated that carcinoma in the gastro-intestinal tract is at first a local lesion abundantly capable of extirpation and susceptible of complete cure. The factors involved are: first, early diagnosis and second, adequate operative removal of the disease.

Early diagnosis implies watchfulness on the part of the patient and intelligent interpretation of symptoms by his medical adviser together with utilization of every known method of examination. It is in helping to gain these objects that a public cancer campaign like the present may be of the highest benefit.

The classical picture of carcinoma of the stomach is familiar to all physicians and many laymen. The sufferer is two or three times more likely to be a man than a woman and to be in the middle or later period of life. Attacks of upper abdominal discomfort, "gas" and loss of appetite have been succeeded by loss of weight and strength, pallor and vomiting. On examination there is evidence of mal-nutrition and an appearance of illness (cachexia), secondary anemia and very likely a palpable mass in the epigastrium or liver. The vomitus may be at times bloody and changed blood is found in the stools. Gastric lavage shows a diminished or absent hydrochloric acid, evidence of stasis and of hemorrhage. This picture, or a slight variation, is rarely wrongly interpreted, but unfortunately it carries also the death warrant of the patient, for the disease has progressed much too far to permit of radical extirpation. Diagnosis must be made long before this or nothing radical can be accomplished by surgery. An analysis recently made of a series of cases of carcinoma of the stomach brings out many helpful points. Comparative youth is not incompatible with the diagnosis since a few cases occur in the decade 21-30; 8.4% occur in the decade 31-40; 24.5% in the decade 41-50; 35.5% in the decade 51-60; 25.4% in the decade 61-70 and 5% in the decade 71-80. The prevailing conception that carcinoma of the stomach is not likely to occur before 45 or 50 years of age must be modified. An analysis of symptoms first complained of in this group of patients shows that about 45% first noticed epigastric pain or distress, usually, but not necessarily, coming on after eating. In some 11%, belching of gas without especial distress was noted. Nausea or vomiting was the first complaint in 8.5%. Add to these the occasional patient, who first complains of sour stomach, dysphagia or a mass in the epigastrium and we find that in at least 75% of patients, the earliest symptoms, either from their location or character point directly to the stomach as their source. The remaining 25%, however, who complain first of general weakness and debility, loss of weight, constipation, pallor, back-ache, loss

of appetite or general abdominal pain, constitute the group in which both patient and physician may be gravely misled as to the source and significance of the symptoms.

Unfortunately, it is a very common experience that when the onset of symptoms has been followed by correct diagnosis and operation, the condition has been too often found to be already inoperable. The explanation lies, of course, in the insidiousness of the disease and its failure to cause symptoms, due to the fact that the stomach has a marvelous margin of physiological efficiency or even, as is well known its digestive function may be largely dispensed with under certain conditions without serious interference with the patient's economy. Although the stomach plays a most important rôle as a reservoir and mill where the digestion of carbohydrates is carried on for some time after insalivated food has reached it, where proteolytic digestion is begun and the food mass, as a whole is subdivided and liquefied in preparation for intestinal digestion, it is nevertheless true that these functions may be largely abrogated with little effect upon the economy, provided only that a reasonably clear passage remains to transmit the food from the oesophagus to the duodenum; and provided also that hemorrhage from ulcerated tumor surfaces or absorption of toxic material do not attract attention by the anemia and debility which they occasion. Every surgeon has seen patients in whom the stomach was very widely involved by disease although symptoms had been present for but a brief period. In the analysis above mentioned, the duration of symptoms was noted in a series of patients in whom the disease was found to be so advanced that even an exploratory laparotomy or a palliative operation was not undertaken, and it was found to be 2 months or less in nearly 10%, from to 2 to 6 months in 27% and from 6 to 12 months in 13%. Further evidence of this is shown in this same series; the duration of life in a group of inoperable cases after they first came under the observation of the surgeon who did not attempt operation was four weeks or less in 45% of the cases. Considering these facts, it is evident that but few cases are found amenable to radical operation.

How then is earlier diagnosis to be assured? Only by eternal vigilance on the part of patient and physician and by the education of the latter to use every reasonable means of diagnosis and to interpret sagaciously the evidence obtained. Since doctors, being but human are sometimes fallible or careless, it is very desirable that patients should be educated in methods of diagnosis sufficiently to demand them, if they are not proposed by his medical attendant. Because the greater majority of symptoms of which a patient may complain have their cause in minor functional disturbances which are transient and self-limited, it is usually the tendency of both patient and physician to minimize their importance and employ none but the simplest diagnostic measures. Doubtless if every symptom were always considered by the physician in the light of its most serious possible interpretation an enormous amount of unproductive diagnostic effort would be wasted, but it is safe to say that there would be a most satisfactory increase in the number of cases of carcinoma of the stomach which were found at operation to be operable. A reasonable mean between the two extremes should be striven for. Any symptoms pointing toward the stomach or epigastric organs which are not relieved by symptomatic or expectant treatment in the course of a week or two should be subjected to adequate diagnostic scrutiny. These symptoms in their order of frequency may be enumerated as pain in the epigastrium, a sense of fullness and distress after eating; sensations of the accumulation and belching of gas, anorexia, nausea or vomiting; in fact, any noteworthy change in the patient's digestive habit should receive serious attention. Moreover symptoms of less pointed significance should not be ignored. If a previously normal individual is noted gradually to be becoming pale or to lose weight or to seem lacking in strength and ambition or to be complaining of loss of appetite or dorsal back-ache, it should be assumed that some organic cause exists for such phenomena rather than that the condition may be dismissed as due to some trifling disarrangement of function.

METHODS OF DIAGNOSIS

A carefully taken and critically analyzed history is the most important preliminary method and will often permit diagnosis. In the obviously neurotic or chronically dyspeptic individual who has had for years a more or less vague symptom-complex pointing to the stomach and who does not present any noteworthy change especially of an objective character like loss of weight, anemia or vomiting, the history is much less likely to be significant than in a previously well individual who gives a story of a possibly slight but persistent complaint which has not yielded to simple measures. The next step is a thorough physical examination which is likely to be negative, but may disclose a mass in the epigastrium which moves downward with inspiration. A widespread belief exists that when carcinoma of the stomach has advanced sufficiently to show a palpable mass, it is almost certain to have reached the inoperable stage. This is erroneous. Statistics show that in about 70% of cases the disease starts at or near the lesser curvature between the incisura and pylorus, which is precisely that portion of the stomach which, being covered neither by the costal arches or liver is most readily accessible to palpation; moreover the nearer to the pylorus the growth is the more likely is it to have caused early symptoms on account of obstruction to the out-

flow of the gastric contents and the more amenable it is to treatment. A person who has lost a good deal of weight from pyloric obstruction and who presents a discrete movable mass in the epigastrium is quite likely to prove to be a highly favorable case for radical operation. More often, unfortunately, the thick panniculus and the rectus muscles make it impossible to feel the tumor, even when it has reached considerable dimensions. Other positive findings on examination such as enlargement or nodularity of the liver or a small hard insensitive mass in the abdominal wall at the umbilicus or a hard gland behind the left sterno-clavicular articulation near the thoracic duct are indicative of already existing metastases which render radical operation hopeless. Still later manifestations such as jaundice indicating widespread involvement of the liver, ascites and secondary implantation masses felt in other parts of the abdomen, perhaps by rectal or vaginal examination, are characteristic of the latest stages of the disease.

Analysis of the gastric contents is hardly likely to be more than suggestive. The finding of a partial or complete achlorhydria especially with the presence of blood and evidence of stasis is strongly suggestive but there are many non-surgical causes for diminished acidity, especially pernicious anemia, and blood may be due to a peptic ulcer or to rupture of varices about the cardia or to traumatism by the tube. The demonstration of tumor cells in the debris from the stomach is too rare and difficult to be of much use. As a working rule, subject to many exceptions, it may be said that a simple ulcer is almost always associated with a high or at least a normal acidity while carcinoma usually is characterized by the diminution or even the absence of hydrochloric acid. The demonstration of persistent occult bleeding by examination of the stools is important but obviously may be due to ulceration anywhere in the alimentary tract and does not indicate its location. By far the most important method of examination is by x-ray. Fluoroscopy and films after the patient has taken an opaque medium like barium sulphate will give a diagnosis of carcinoma of the stomach in a very high percentage of all cases and will give evidence of the presence of a lesion of uncertain type in most of the remainder. The typical filling defect of carcinoma is unmistakable. In patients whose disease has not progressed sufficiently to produce this defect it will almost always be possible to arrive at a diagnosis by observing the failure of a peristaltic wave to pass over a certain area of the stomach, thus indicating an induration and loss of elasticity in the wall at that point, or the disturbance of the normal rugae of the mucous lining over a given area will indicate a similar change. Broadly speaking it is only the very unusual type of carcinoma situated at the extreme fundus of the stomach to the left of the cardia and not encroaching upon it, which may escape observation, and it should be noted that in most instances where the appearances justify a doubt they present nevertheless as alternative diagnoses lesions which justify or demand operative exploration. Such instances are certain types of gastric or pyloric ulcer, and gall bladder, pancreatic or transverse colon lesions which distort the outline of the stomach or interfere with its function. But in relation to x-ray a warning should be issued that such an examination in the hands of an inexperienced man may be inconclusive or wholly misleading and may be much worse than no examination at all because if a mistake is made it may lead to a false feeling of security and to fatal delay.

An exact and thoroughly justifiable method of diagnosis in certain instances is a surgical exploration. The laity should be educated to understand that such an incision, in the hands of a skilful surgeon, is nearly harmless and will be quickly recovered from and is far to be preferred to the uncertainty and possibly fatal delay in doubtful cases. Surgeons themselves should adopt as a routine procedure, except where contra-indicated, the manual exploration of all the abdominal contents including the stomach, whenever the abdomen is opened for any other purpose. This gospel has been preached by the masters of surgery ever since the abdominal cavity has become a legitimate field for their art, and yet it is surprising how widespread is the neglect of it. In a recent trip to Europe, thirteen important surgical clinics were visited by the writer and in hardly any instance was this routine abdominal exploration carried out. It is certain that some early instances of carcinoma of the stomach would thus be disclosed.

If the patient's general condition is such as not to preclude radical operation the physician should never permit himself to be totally discouraged by the apparent extent of the growth. In very many instances the lesion is confined to the stomach for a long period and the first relay of regional lymph nodes, situated as they are, especially along the lesser curvature of the stomach at the attachment of the gastro-hepatic omentum, do not preclude the possibility of radical removal. One of the surprising facts brought out by the analysis above mentioned is that in the whole series of patients who were explored there were metastases in the liver in only 23.3% and that among a series of patients who died of the disease without operation and who were examined post-mortem metastases had not yet taken place to the liver in 22.8%. In other words in a considerable number of patients although the disease may be locally extensive in the stomach it does not become totally

inoperable by virtue of hepatic metastases. A further very important justification for operation is the fact that if it discloses a radically inoperable condition it is very often possible to perform a palliative operation for the relief of the obstruction which may make the patient quite comfortable until a short time before his death.

The results of exploration on a series of patients showed that over 60% presented a condition too advanced for any attempt at radical or palliative operation. In 22.4% it was possible to do only a palliative operation for the obstruction or for perforation, involving a mortality of 13% which was largely due not to the seriousness of the operation performed but to the severity of the condition which made operation imperative. In less than 10% of patients was it possible to attempt a radical operation, which carried an operative mortality of 13%. Those who recovered, lived a varying number of years and a number are still living after a lapse of time which justifies the belief that a radical cure has been effected. Such a record would be discouraging were it not for the absolute conviction on the part of experienced surgeons that with early diagnosis it may be vastly improved.

CANCER OF THE INTESTINAL TRACT

The duodenum, jejunum and ileum are extraordinarily immune from carcinoma. The mere fact that a distorting or deforming lesion is noted by x-ray to be beyond the pylorus justifies the radiologist in saying that it is ulcer rather than cancer which, of course, is corroborated by other characteristics. A neoplasm which begins just proximal to the pylorus may spread up the lesser curvature and over both surfaces of the stomach and yet appears to be arrested at the pylorus from extension distally. An exception to this rule is a not very uncommon form of carcinoma originating at the biliary papilla and thence spreading, by continuity, to the duodenal wall. Involving eventually as it does the common bile duct, pancreatic duct and the pancreas itself and being in such close proximity to other important structures, this lesion is practically inoperable. Occasionally a fortunate circumstance will permit a radical resection at the expense of a very high mortality rate, but it cannot be expected that in this situation a neoplasm will ever offer a brilliant surgical prospect. In the jejunum and ileum, carcinoma is so rare that but one case has been observed at the Peter Bent Brigham Hospital in the fifteen years of its existence. This part of the alimentary tract then may be ignored in a discussion of carcinoma for the purposes of a public campaign for cancer control.

The colon is however a region affected by carcinoma in more than one-half as many cases as the stomach and here we find that our record is decidedly more reassuring. The colon is physiologically less important to the individual than is the stomach and it is evident that the relatively small portion of its total length which is the seat of a malignant neoplasm may be removed without impairment of function. Moreover the colon is anatomically more accessible and on account of the simplicity of its blood supply and other relations is technically more easily operated on. Still again, the fact that its lumen is so much less than that of the stomach causes an obstructing lesion to cause symptoms at a much earlier date especially in the distal colon whose contents are of a pultaceous or semi-solid consistency. Metastases seem on the whole to occur later in a lesion of the colon than of the stomach and the long mesentery permits the first relay of regional glands to be comparatively easily extirpated. Finally, it is well known that an operation in the lower abdomen is less serious in regard to possible post-operative complications than an operation of equal severity in the upper abdomen, chiefly due apparently to the liability of the latter to pulmonary complications on account of the close proximity of the thoracic cavity. For these reasons carcinoma of the colon is likely to permit of earlier diagnosis and of technically easier and less dangerous operative removal than the same disease in the stomach.

A review of the records of the Peter Bent Brigham Hospital from its foundation in 1913 to the end of 1927 shows a total of 183 cases of carcinoma of the colon (carcinoma of the rectum involving also the lowest portion of the sigmoid is not here considered). The age incidence is shown in the following table:

Age	No. of cases	Per cent.
21-30	7	3.8
31-40	14	7.6
41-50	30	16.4
51-60	65	35.5
61-70	44	24.0
71-80	17	9.3
81-90	2	1.09

While this table shows, as is usual in malignant disease, that the maximum incidence is in the sixth decade when 35.5% of the cases occurred (which is exactly the same figure as in the case of carcinoma of the stomach), it is very important to know that nearly 4% of the instances occurred in persons 30 years of age or under,—nearly four times as many as in the case of the stomach. Moreover an appreciable number occurred in the ninth decade which period showed no instances of carcinoma of the stomach. The disease in the colon therefore appears to be more prevalent in comparative youth and in extreme age than is carcinoma of the stomach and evidently it is necessary for the practitioner to bear this in mind although his preconception of cancer as a disease of middle life is very strong.

In this series of cases the location of the disease was as follows: right colon including the caecum and hepatic flexure, 48 cases or 26.2%; transverse colon, 17 cases or 9.3%; splenic flexure and descending colon 20 cases, or 10.9%; sigmoid flexure 77 cases or 42%. The location is of great importance as bearing on the symptomatology because the fecal current is liquid when it passes through the ileocecal valve, becomes less fluid or even pultaceous in the transverse colon and loses still more of its water in the descending colon and sigmoid. Therefore a degree of blocking of the lumen which would cause partial obstruction in the left colon would not act thus in the right colon and this is the more true because the lumen of the descending colon is as a rule considerably less than that of the more proximal portion of the bowel.

If the physician carries in his mind a single and relatively unvarying clinical picture of carcinoma of the colon he is likely to be perplexed and misled because the disease in the right colon presents such a very different picture from that in the left colon, with the transverse portion of the bowel intermediate between the two. In the caecum and ascending colon the disease is extremely insidious, and obstructive symptoms appear only very late, if at all because the liquid fecal stream can find its way through a very small lumen. For a long while after the onset of the disease there are probably no symptoms at all. After ulceration of the surface of the neoplasm occurs the irritation may cause spasm and painful contraction of the bowel expressing themselves as mild attacks of colicky pain. These have no definite relation to eating or to bowel movements. A sense of fullness and accumulation of gas is often complained of which is misleading since as a rule the diseased colon is irritable and empty. Such vague symptoms referred to the right iliac fossa often lead to the diagnosis of disease of the appendix, leading all too often to the removal of that organ through an incision too small to permit of adequate exploration. The stools are usually normal in gross appearance but if carefully followed will show the persistent presence of small amounts of blood,—often only to be determined by chemical test. Sometimes the irritability of the colon at the diseased point is propagated to the distal part of the bowel causing a tendency to frequent loose stools. Physical examination will often reveal nothing except a vague and inconstant sensitiveness over the right colon often with slight muscle spasm. Later when the disease has become more advanced a massive firm insensitive tumor may be felt which does not descend with respiration and is more conspicuous anteriorly than in the lumbar region. X-ray after the ingestion of the opaque meal may show little or nothing because the barium is so unevenly scattered and dispersed that this portion of the colon is not outlined. There may be a tendency to stasis in the terminal ileum due to spasm of the ileocecal valve or to actual obstruction at that point, but at the region of the tumor itself the bowel is likely to be empty. If suspicion points at all to a lesion of the colon a barium enema should never be omitted. This may show enough obstruction to prevent complete filling of the bowel proximal to the lesion or a certain degree of irregularity of contour may be noted together with a tendency on the part of the bowel to refuse to harbor the barium without irritable contraction. In carcinoma originating in the caecum it is not very unusual for the growth to obstruct the lumen of the appendix at its junction with the caecum and thus by producing an appendiceal block to cause a true and characteristic attack of acute appendicitis which may lead to operative removal of the appendix without the discovery of the underlying disease. Another not uncommon complication is perforation of the bowel causing either peritonitis or a retrocecal and extra-peritoneal abscess forming a tender mass accompanied by symptoms of constitutional disturbance.

The point for physicians to remember is that persistent discomfort and pain in the right abdomen if unaccounted for by other causes and especially if accompanied by gross or chemical traces of blood in the stools should indicate the necessity of an exploration which will not be sufficient if carried on through a small incision adequate only for the removal of the appendix. The insidiousness of this disease and the occasional futility of the most conscientious care on the part of both physician and patient are illustrated by the case of W. H. D. (S. No. 29995) a man 68 years of age who entered the Brigham Hospital on October 31, 1927.

The history showed that the patient consulted a competent and careful physician in March 1925 because he had read of the importance of periodic health examinations and thought it advisable to be looked over. He had no symptoms of any sort and a careful general examination was essentially negative and he was given a clean bill of health. He reported on December 3, 1925 that he felt perfectly well. On March 16, 1926 he reported that he had been perfectly well during the year since his first examination and another complete physical examination was negative except for some evidence of arteriosclerosis. Nearly 19 months later in October 1927 he again consulted the physician saying that he did not feel quite so vigorous, that his appetite was not so ravenous and that he was a little short of breath on exertion and got more easily tired, and noticed slight dizziness on bending over,—complaints quite compatible with his age which was now 68. There were no symptoms of indigestion and the stools were regular and normal. On this occasion his physician found that he had lost five and a half pounds of weight since the first examination and that he did not look as well as formerly. The liver border which had always been palpable seemed of rather firm consistency. The blood showed a slight secondary anemia. Stool examination showed positive guiac

and benzidine tests. Barium x-ray studies were at once made and showed a filling defect at the hepatic flexure, with moderate proximal stasis. Operation was at once advised and on November first the abdomen was opened and an extensive adenocarcinoma of the hepatic flexure was found with metastases to mesenteric glands, numerous metastases in the liver and numerous small peritoneal implantations throughout the abdominal cavity. Radical cure was of course out of the question and a palliative colocolostomy seemed indicated to prevent obstruction which it seemed must necessarily soon appear, but it was realized that the patient was constantly losing blood and his condition seemed so good that it appeared justifiable to resect the growth with a view to stopping hemorrhage and averting obstruction at the same time. The operation was apparently well borne but ten days later the patient succumbed to peritonitis and pulmonary complications. Autopsy showed in addition to the findings already mentioned metastases to the lungs and a secondary area of adenocarcinoma in the distal part of the transverse colon, apparently a transplant from the first. From our knowledge of the natural history of the disease it seemed certain that this malignant process, which is usually of slow growth in an elderly man, must have been well established at the time of his first periodical health examination more than two and a half years previously, and yet, there was absolutely no cause to suspect its existence. It is evident that the disease is so insidious that it may be impossible of diagnosis at an operable stage unless indeed a complete gastro-intestinal barium study including an enema is to be part of every periodic health examination.

The typical neoplasm of the left colon presents symptoms almost solely due to obstruction of the lumen of the bowel. A slight constipation is noted or any already existing degree of constipation increases. As time goes on a tendency to generalized colicky pain appears, usually below the level of the umbilicus, a sensation of abdominal fullness and accumulation of gas sometimes precedes this pain which is relieved by a bowel movement. Attentive daily observation of the stools by the patient will usually show from time to time a small amount of relatively fresh blood, although usually the patient on questioning will state that he has noted nothing abnormal. As time goes on, constipation, the attacks of colicky pain and the abdominal distension increase and the former is sometimes alternated with brief attacks of diarrhoea, due apparently to nature's effort to overcome the increasing obstruction by liquefying the stools. Up to this time physical examination may be absolutely negative or in a favorable subject a small mass may be felt in the left abdomen which does not disappear after catharsis or on enema. In the case of the sigmoid flexure the best chance of feeling the mass is for the examiner, with the patient lying on his side, to make a bimanual examination with one finger in the rectum and the other hand palpating the abdomen. Rectal examination alone is usually negative; a stool examination sooner or later will show either grossly recognizable blood or positive chemical tests and x-ray examination, after the ingestion of barium by mouth will show a tendency to stasis, but it will be a matter of good fortune if any single film shows clearly the neoplastic constriction. If the slightest suspicion of its presence exists however, a barium enema should be invariably made which will give positive evidence of an obstructing constriction in a very high percentage of patients who show the symptoms above mentioned. As the disease progresses, enlargement of the liver may be noted from metastases, or other manifestations of a disseminated malignant process. It is more usual, however, before evidence of this condition appears, for the neoplastic obstruction to shut down entirely and cause the well known symptoms of low intestinal obstruction,—obstipation, failure to pass gas, abdominal distension, generalized colicky pain, and vomiting at first gastric in character and becoming progressively biliary, jejunal and semifecal as the days go by. If the symptoms approach those of complete obstruction, barium should never be given by mouth.

This picture which carries such a threat of fatal consequence must not discourage the physician from immediately seeking competent surgical advice, for these neoplasms of the left colon, especially of the sigmoid flexure where they are most common may have existed so long that they have completely occluded the bowel and caused total obstruction and yet still themselves be wholly local and susceptible of a complete operative removal with permanent cure.

The symptomatology and diagnosis of carcinoma of the transverse colon are intermediate in character between those typical of the right and left portions of the bowel and need no special description except the notation that because of its position such a lesion is much more easily demonstrated by palpation and therefore likely to be diagnosed rather early.

As a foil to the somewhat discouraging picture drawn above of the fatal insidiousness of carcinoma of the right colon, mention may be made of a certain day in July 1918 when two patients were operated on at the Peter Bent Brigham Hospital.

The first, C. L. M., a man age 53 years, who had had chronic pulmonary tuberculosis and a duodenal ulcer for years, sought advice for nocturnal polyuria. The history brought out the existence of constipation, distress after eating, belching of gas, for a long period and the presence of occasional occult blood in the stools—symptoms attributable to the ulcer. For about a year there had been attacks of colicky abdominal pain, relieved by belladonna and gross blood had been noted occasionally in the bowel movements, supposedly due to hemorrhoids. The polyuria complained of proved to be of no importance but fortunately routine physical examination showed a small mass in the right abdomen. The stools showed persistent occult blood. Barium by mouth showed some stasis in the caecum and by enema a slight delay at the hepatic flexure, with irregularity of outline but no obstruction. Immediate operation was done and a large malignant tumor involving nearly the whole of the ascending colon with secondary

adhesions to the proximal part of the transverse colon, was removed and the ileum anastomosed to the transverse colon end to side. Pathological examination showed adenocarcinoma. An uninterrupted convalescence ensued and now ten years later the patient shows no evidence of recurrence and has been actively engaged in his profession without symptoms referable to the disease. It is worth noting that three years before he came under observation an alleged "chronic appendix" had been removed elsewhere through a small incision without relief. There can be no question that at that time the neoplasm was present and easily demonstrable if the surgeon's hand had been introduced into the abdomen and the viscera palpated.

The other patient was a woman, M. L. E. (Brigham Hospital No. S. 9003) age 60, who had always been slender, and had had poor appetite and irregular constipated bowel function requiring daily use of cathartics for years. One year previously had occurred an attack of obstipation, pain and vomiting, relieved after three days by enemata and turpentine stupes. Since then she had complained of lassitude, fatiguability, increasing constipation and tenderness in the left lower abdomen and more or less constant dull pain in that region, not relieved by anything in particular. She had never noted blood in the stools. Examination showed a small mass in the left lower quadrant. Rectal examination was negative. Barium x-ray studies showed a filling defect at the junction of the descending colon and sigmoid without obstruction. At operation a malignant adenocarcinoma in the descending colon with its mesentery was resected. An end to end anastomosis was made without any proximal temporary colostomy. The convalescence was uninterrupted. Pathological examination showed adenocarcinoma with metastases to the mesenteric lymph nodes. Eight years later she had no symptoms referable to the disease and barium x-ray studies showed a normal gastro-intestinal tract. She died soon afterward of an acute non-related disease.

It scarcely needs to be pointed out that an attack of obstipation severe enough to cause pain and vomiting of three days' duration should have led at once to every appropriate diagnostic measure. It is precisely in such chronically constipated ailing women that the significance of symptoms is disregarded.

The story of another patient illustrates extraordinarily the amenability of this disease to surgical relief.

M. E. F., a woman age 32, (Brigham Hospital No. S. 30774), came under observation on February 27th, 1928. She began to notice blood in the stools about four and a half years previously and was treated locally for alleged hemorrhoids. She became anemic and debilitated and had malaise, weakness and dizzy spells. For the last three years she had also noticed a few clots in the menstrual flow but the periods were otherwise normal. Appetite was excellent throughout and there was a moderate tendency to constipation. About three months before admission she began to notice a dull pain in the lower abdomen, unrelated to any physiological function. None of these symptoms however were sufficient to keep her from uninterrupted work. On January 10th she consulted a physician on account of the pain. A mass was felt in the abdomen which the patient stated was freely movable, and which sometimes lay below the umbilicus but could readily be pushed up to the costal margin. A diagnosis of fibroid tumor of the uterus was made and a laparotomy performed at which time a malignant tumor, variously stated by her attendants to be of the stomach and of the sigmoid was found. Extensive metastatic glands were said to have been present, one of which was removed for diagnosis and was later reported by a competent pathologist to show chronic inflammation. The wound was closed and the patient sent home after ten days with the diagnosis of inoperable cancer. She had two x-ray treatments. Three weeks after her return home, the wound burst open and a profuse fecal discharge appeared which had since persisted. On admission to the Brigham Hospital examination showed a moderately anemic, somewhat emaciated and asthenic intelligent young woman with a large firm insensitive mass in the abdomen subjacent to a partially healed wound at the upper angle of which was a granulating sinus with a profuse fecal discharge. Vaginal examination showed a normal cervix, uterus and adnexae. Rectal examination was negative. Barium x-ray examination showed irregularity of the transverse colon and narrowing and fixation of a loop of sigmoid at a point subjacent to the abdominal wound. The patient and her family were eager to grasp at the very remote possibility offered by another operative attempt. Operation was done on March 2, 1928 under the difficulties occasioned by the presence of a fecal fistula and an old infected wound. A huge malignant mass, primary in the transverse colon and involving by direct extension an adherent loop of ileum and of sigmoid flexure and also the greater curvature of the stomach, as well as the abdominal wall, was found. However, exploration showed no involvement of the liver and no certain evidence of metastases to lymph nodes. Complete removal was done involving resection of the transverse colon, a loop of ileum and of sigmoid and of stomach and abdominal wall. An end to end anastomosis of the ileum was made, the sigmoid and stomach repaired and the ends of the resected transverse colon brought out of the wound according to the Mikulicz procedure. It was impossible to obtain an aseptic field on account of the fecal fistula. The patient survived the immediate operation surprisingly well, but died in five days of peritonitis. Autopsy showed satisfactory repair of the intestinal anastomoses without evidence of leakage and that the peritonitis was due to the necessity of working in an already infected field, but the point of vast significance is that it showed absolutely no evidence of metastases to liver or lymph glands, even the mesenteric nodes being uninvaded. In other words, after nearly four and a half years of bleeding and in spite of the very extensive local growth of the malignant tumor it nevertheless had not disseminated itself by the blood or lymph stream and was perfectly susseptible of successful and complete removal. Had the radical operation been done seven weeks earlier at the time of the first fruitless exploration it would almost certainly have been successful. Had it been done at any time during that long period of relatively symptomless bleeding from the rectum its success would have been still more assured. It should be added that careful questioning of the patient failed to reveal that any of the usual symptoms of hemorrhoids had ever existed.

In the Brigham Hospital series above referred to comprising 183 cases of carcinoma of the colon, 30 patients were not operated on because either operation was refused or it afforded no prospect of palliation or cure. In 13 patients, a simple exploration was done which showed an inoperable condition either for palliation or cure. There was no mortality in this group. In 65 patients palliative operations were carried out with 26 deaths or a mortality of 40%. These

operations comprised drainage of peritonitis caused by perforation of the malignant disease or colostomy for complete obstruction. There were a few instances of entero-colostomy or colo-colostomy to sidetrack the growth and relieve obstruction. This large group of palliative operations included, as the very high mortality shows, mostly desperate cases in which operative relief was offered as a last resort. Most of these operations were done under novocain and no such operation was withheld if it offered any reasonable chance of temporary relief from an unsupportable condition. There were 74 radical resections with 12 deaths, giving a mortality rate of 16.2%. The 62 patients in this group who made an operative recovery left the hospital relieved of their symptoms and many, as in the two instances cited above, have lived many years and may be considered "cured". The final figures in the follow-up statistics of these patients are not as yet available.

From the point of view of those who are interested in the *American Society for the Control of Cancer, Inc.*, what interpretation may be made of this brief review of the status of carcinoma of the gastro-intestinal tract as regards its feasibility of cure? There can be but one answer: that the disease is curable and that while we await the demonstration of the cause of cancer which will be followed in all probability by the discovery of a non-surgical method of cure, immense progress may be made in the efficiency of the surgical treatment through the education of both physician and layman. The latter must disabuse his mind of the gloomy conviction that cancer is hopeless; the former must be aroused to take action at the first warnings of the disease. The earliest symptoms of cancer wherever situated in the human body are trivial in character,—it follows then that all trivial symptoms unless they yield promptly to simple measures must be considered potentially as the first evidence of a terrible but curable disease and subjected to every available and proper diagnostic measure. The promotion of these objects by a campaign of education constitutes at present the most promising way of winning ground in the fight against cancer.

MALIGNANT DISEASE OF THE GENITO-URINARY TRACT

BY GEORGE GILBERT SMITH, M.D., F.A.C.S.*

TUMORS OF THE KIDNEY AND URETER

On March 14, 1925, J. W. C.—, a carpenter 68 years of age, was referred to me by Dr. E. M. Fuller of Bath, Maine. His sole complaint was hematuria. The first attack of this was in September, 1923. No more blood was seen for one year; he then bled again and had had several attacks since. Except for the difficulty which he experienced in passing clots of blood, he had no urinary symptoms. There had been no pain in the loins, no loss of weight or strength. On abdominal palpation the lower pole of the right kidney was easily felt; it was nodular, movable, and as large as a small orange. The left kidney was not palpable. The prostate was small and soft and there was no residual urine. The urine was hazy and showed a slightest possible trace of albumen, no sugar, 5-10 red blood cells and 2-4 leukocytes per field, one large clump of pus, and 3 granular casts. Cystoscopy showed a normal bladder. Both ureters were catheterized; a divided function showed 15% of phthalein from the left kidney and but 5% from the right. A right pyelogram showed a filling defect of the lower and middle calyces which was typical of renal tumor. On March 25, 1925 a right nephrectomy was done. The kidney tissue in its lower 2/3 was replaced by a hypernephroma.

Two years later the patient returned for examination. He felt well, was working regularly, and showed on careful examination no evidence of recurrence.

In this case the presenting symptom was hematuria, a sign which always demands cystoscopic investigation. Hematuria usually brings the patient to his doctor post haste, but it is a sad fact that not infrequently the patient is dismissed with "reassurances" and the promise to investigate "if the bleeding keeps on".

In the majority of cases of renal tumor hematuria is not the first symptom. In a study of 62 cases of hypernephroma occurring at the Massachusetts General Hospital Smith and Shoemaker found that only 27 of the 62 cases showed gross blood in the urine; the most consistent finding was that of tumor. An enlarged kidney was found in 48 cases, in some of which the patient himself had first noticed the mass. Every case of enlarged kidney should be regarded as suspicious, whether or not it is accompanied by hematuria, and should be subjected to cystoscopic study, for it is possible to have an advanced hypernephroma without hematuria or pain. Pain was noted in 32 of these 62 cases, but pain is of course a less reliable symptom than tumor or hematuria.

Epithelial tumors of the kidney pelvis are much less common than hypernephroma. In 1922 Smith and Gilbert collected from the literature 178 cases of tumors primary in the renal pelvis, and added one more. In these cases hematuria is the most prominent symptom, occurring in over 70% of the papillary group and in 50% of the non-papillary group. In the former group the tumors vary in malignancy from the benign papilloma to the papillomatous adenoma; from these tumors, because of their friability and their formation, fragments are likely to break off and become implanted along

*For record and address of author see "This Week's Issue," page 524.

the ureter and in the bladder. Consequently the entire ureter, as well as the kidney, should be removed. The non-papillary carcinomas of the renal pelvis involve the ureter only by extension, not by transplantation. Since they are less likely to bleed than the papillary tumors, they do not give symptoms so early, and are likely to have given rise to metastasis before they are discovered.

Embryonal neoplasms occurring in the kidney of infants are usually discovered because of the tumor which they produce in the flank. Hugh Young states that these tumors frequently originate from the retroperitoneal tissues about the kidney, involving the kidney in their growth. Their removal is indicated but recurrence is the rule.

Tumors of the ureter are rare. Jeanbrau in 1914 had collected only 30 cases of primary tumor of the ureter. (H. H. Young.) In the one case which I have seen, the tumor arose just within the ureteral orifice and prevented the passage of a ureteral catheter. This was a highly malignant carcinoma which recurred in spite of the removal of the kidney, ureter and adjacent bladder wall.

Primary ureteral tumor may be suspected if the jet from the ureter is bloody and the urine drawn by the ureteral catheter from the renal pelvis is clear. The diagnosis may be made certain, or practically so, by a ureterogram.

TUMORS OF THE BLADDER

A man of 45 was referred to me on March 30th, 1928, by Dr. F. C. Gunter, because on several consecutive examinations of the urine numerous red blood cells were found in the sediment. The urine had never been grossly bloody, nor had the patient noticed any symptoms except a slightly increased frequency of urination and a slight discomfort in the suprapubic region first felt 9 months ago. Cystoscopy showed a solid, round, pedunculated tumor, evidently malignant, rising from the roof of the bladder. At operation, April 7th, the condition was found to be as it appeared through the cystoscope. A section of the bladder wall with the tumor rising from the center was excised with the diathermy knife. Pathological examination of the specimen removed showed it to be a squamous cell carcinoma of moderate malignancy. There was no evident involvement of the bladder wall.

This case illustrates the importance of careful urinalysis and of cystoscopic investigation when red blood cells are found. Blood in the urine is the one out-standing sign of bladder tumor, although sessile epitheliomas, covered by intact mucosa, may grow to an advanced stage without causing hematuria.

There are, according to Ewing's classification, two common varieties of bladder tumor: (1) papilloma, which is fibrous, benign, or malignant and (2) carcinoma. There are other rare forms, but they are clinically unimportant. Papillomas of the bladder vary in the degree of their malignancy. In a few cases, they remain benign for years. I have under my care such a case. In 1917 he was operated upon for tumor of the bladder. The growth recurred and when I saw him in 1925 the entire bladder wall was covered with large and small pedunculated tumors. The patient was anemic from loss of blood, and septic and uremic from infection of the bladder and kidneys. The bladder was opened, the larger tumors cut off with the diathermy knife, and the entire surface of the bladder cavity thoroughly treated by electrocoagulation. After a long convalescence, during which the bladder was drained suprapubically, he healed up and regained his health. Since then his urine has become clear of infection, and the few recurrences which have developed have been destroyed through the cystoscope.

All papillomas are potentially malignant. Buerger places the proportion of carcinomas preceded by papilloma at 30 to 36 per cent. It is not always possible to differentiate between the benign and the malignant papillomas by their cystoscopic appearance. Carcinomatous degeneration in a papilloma produces a more solid appearing tumor, with the individual fronds presenting rounded, shiny tips instead of pale, fringe-like ones. Areas of necrosis are indicative of malignancy. Whether the tumor is actually malignant or not makes little difference in its treatment. If it measures no more than 2 cm in its greatest diameter, and has a small pedicle, it can probably be destroyed by electrocoaglation through the cystoscope. The modern apparatus for bipolar electrocoagulation is so efficient that tumors formerly believed too large to be treated by this method can now be successfully destroyed by a few treatments. After the tumor has been eradicated, the patient should be cystoscoped at frequent intervals so that recurrences may be destroyed while still small. In some cases, fortunately a minority, malignant degeneration has already taken place in the base of the pedicle, so that, in spite of thorough electrocoagulation, the growth will recur as a definite sessile carcinoma. In spite of the possibility of this, I am in favor of destroying moderate sized papillomas through the cystoscope instead of removing them by resection of the bladder wall. In my experience, recurrence is just as likely to occur after excision as after electrocoagulation. It stands to reason that the earlier these tumors are discovered, the better the prognosis.

If the papilloma has a thick pedicle, or none at all, the bladder should be opened and the growth destroyed by thorough electrocoagulation or by the implantation of seeds of radium. I prefer the former method, because of the more rapid healing of the treated area. Radium burns may persist for over a year, with accompanying infection and possibly stone formation. Deep infiltration of the bladder wall, in my opinion, is better treated by radiation than by electrocoagulation.

Squamous cell carcinomas of the bladder are essentially infiltrating, and sometimes extend beneath the mucous membrane without causing ulceration. These tumors are highly malignant and may give rise to distant metastases. I remember one case in which a supraclavicular gland was invaded. In November 1926 I reported in this JOURNAL a case of squamous cell carcinoma of high malignancy, treated by radium implants through the open bladder, which was well 5 years after operation.

People seldom die of cancer of the bladder per se. As Chute has pointed out, death is usually due to involvement of the lower ureters, which causes suppression of the urine and infection of the kidneys. Distant metastases from papillary cancers are rather unusual (Ewing); "extensions occur through the wall of the bladder to the pelvic tissues, up the ureters toward the kidneys, along the pelvic lymphatics to the prevertebral lymph nodes."

The surgical treatment of tumor of the bladder must be thorough and must vary with the type of growth. A small proportion of cases are of such high malignancy that no treatment will avail, but the great majority, *if discovered early*, can be destroyed. Great responsibility rests upon the shoulders of those practitioners who see these patients first; it is only too common to find that precious months were wasted because "a doctor told him he had inflammation of the bladder and gave him medicine without relief." (Extract from the history of a case referred to above.)

CANCER OF THE PROSTATE

Of all obstructing prostates, about 20% are malignant. Unfortunately for the patient, not a few cases of prostatic cancer develop to a point where radical operation cannot be undertaken before they give any symptom of importance. A little frequency, slight difficulty in voiding, may be the only symptoms. Such a case was that of B.—T.—, who 6 months before he came for examination had noted that urination was rather uncomfortable. He had no nocturia and only slight frequency at times. His urine was clear, showed no albumen, and contained only a rare leukocyte and red blood cell. There was practically no residuum. Yet he had a carcinoma of the prostate which had already broken through the capsule and involved the anterior bladder wall. Hematuria is usually a late symptom in prostatic cancer.

The diagnosis is easy, and within the reach of any physician who has ever felt a normal prostate. *The malignant prostate is hard.* Lowsley has pointed out that the cancer, in 80% of cases, begins in the posterior lobe—that portion of the prostate which lies between the veru montanum and the rectum. It is the part of the prostate which the finger first encounters as it enters the rectum. It would be advisable for all men over 45 to have a rectal examination once a year. It is imperative that all men in this period of life should have a rectal examination if they complain of any bladder symptoms whatever. I do not say that all hard prostates are cancerous; some inflammatory prostates simulate malignancy. If the gland is not elastic and slightly movable, it should be examined by some one whose experience qualifies him to make a diagnosis.

The outlook in early carcinoma of the prostate is not too discouraging. The total perineal prostatectomy first described by H. H. Young, consisting of removal of prostate, vesicles and bladder neck, followed by suture of the bladder to the stump of the urethra, has given many satisfactory results. Usually control of urination has been kept; occasionally the patient is left incontinent, or partly so. Even when incontinence results, it is preferable to a suprapubic drainage tube.

In cases too far advanced for the total operation, a partial prostatectomy or removal of the obstructing bar by the punch operation or by excision through the cystoscope will stave off the less desirable suprapubic drainage. The treatment of these cases by implantation of radium has not, in my hands, been very satisfactory. It is a procedure which ought to be considered in some cases.

CARCINOMA OF THE PENIS

Epithelioma of the penis ought to be one of the most easily controlled of all cancers. The growth is generally slow to develop and late to metastasize. It is noticed by the patient himself while it is yet small, unless it develops beneath a phimosis. For this reason every prepuce which is not readily retracted should be circumcised. The areas of leucoplakia which develop from chronic balanitis are probably often the precursors of cancer. Early epitheliomas of the penis may be destroyed by electrocoagulation; in my experience the inguinal glands in such cases are almost never infected. When the growth has penetrated the fibrous layer which underlies the mucosa, partial amputation will usually suffice to remove the entire process. If, however, the cancer has involved the entire glans, or has penetrated the corpora cavernosa, total amputation with dissection of the inguinal regions is the only remedy. In such cases, the penis should be amputated close to the pubes, the scrotum and testicles should be removed, and the urethra implanted in the perineum.

Carcinoma of the urethra is a rare condition. It is usually mistaken for stricture associated with periurethritis, and is seldom diagnosed early enough to do a radical removal. The indurations which are felt in the corpora cavernosa and which are not infrequently thought to be

of a malignant nature are due to fibrosis. I have never seen carcinoma originating in the shaft of the penis.

TUMOR OF THE TESTICLE

These tumors occur most commonly between the ages of 15 and 45. They are of the mixed type and are frequently teratoid in character, containing hair, bits of bone and suggestions of other embryonic structures. Metastases of a carcinomatous nature occur early and invade the lymph glands which lie along the iliac vessels and the aorta. Frequently metastases jump the nearest glands and lodge in the juxta aortic glands about the renal pedicle. Any enlargement of the testicle developing without known cause should be suspected to be a tumor. Barney has reported 2 cases of carcinoma which apparently started in the epididymis, simulating tuberculous epididymitis. Gumma of the testicle is the process most likely to be confused with tumor, consequently a Wassermann test is of diagnostic value. If there is the slightest suspicion of tumor of the testicle, the scrotum should be opened and the gland examined. Hinman advocates an extensive dissection of the area into which the lymphatics from the testis drain. This means the removal of all lymphatics and glands from the retroperitoneal space on the affected side, from the inguinal ring up to the renal vessels. While his opinion is not universally accepted, he has a higher record of cures than other operators who do a simple orchidectomy. Recurrences, if they do occur, are most likely to develop in the retroperitoneal glands of the upper abdomen. They are quite radiosensitive, and often respond well to radiation from radium or X-Ray. Dean reports excellent results from this method of treating such metastases.

CONCLUSIONS

Cancer of the genito-urinary tract is, generally speaking, a difficult type to treat. In many cases the disease is far advanced before it gives any sign which arouses the patient's anxiety. Abdominal tumor, hematuria, pyuria and disturbances of micturition are signs which call for immediate and thorough investigation if we would save the patient. Of these signs, hematuria is unquestionably the most important, both because of its frequency and because of the fear which it inspires. Lower, in a discussion of hematuria, summarizes the findings of a number of urologists; in a series of 100 cases of hematuria, Chute found 64 per cent. to be due to new growths; Walther, in 74 cases, found 51 per cent. to be due to tumors; Kretschmer, in 197 cases, in which the source and cause of the bleeding were determined, found new growths responsible for 50 per cent. Lower himself reports that in 798 cases in which blood was found in the urine, new growth was the cause in 32 per cent.

In this relation it is interesting, and discouraging, to read what Colby has written concerning the histories of a series of cases with tumor of the bladder treated at the Peter Bent Brigham Hospital. These cases were divided into two five-year groups, 1916-1920 and 1921-1925. "It was found that in the first group the symptoms averaged 23.3 months' duration and in the second, 21.8 months. Little progress, then, had been made in aiding this class of patient to an early and accurate diagnosis." Diagnostic methods in urology have now reached a high degree of perfection; competent urologists may be found in every medical center. Adequate measures for dealing with early growths have been developed; the responsibility for seeing that his patient gets the benefit from these achievements of medical science rests directly upon the general practitioner.

CANCER CASE HISTORIES*

BY ERNEST M. DALAND, M.D., F.A.C.S.†

THE following are actual case histories from the clinics of the Collis P. Huntington Memorial Hospital and the Pondville Hospital at Norfolk. They are published with the idea of pointing out certain lessons which should be taught to patients and physicians. Obviously, all cases of cancer cannot be cured. However, it is an established fact that many early cases are curable provided certain standardized procedures are carried out.

*From the Collis P. Huntington Memorial Hospital, Boston, and the Pondville Hospital at Norfolk.

†For record and address of author see "This Week's Issue," page 524.

CANCER OF THE LIP

Mr. C., age 67, entered the Huntington Hospital out-patient department during "cancer week," November, 1922. He complained of a growth on his lower lip.

Present Illness—One year ago operation on his lip for a small growth. This recurred three months later and a second operation was done. Six weeks ago it again recurred.

Past History—Negative.

Local Examination—In the midline of the lower lip is a hard, nodular new growth 1.5 cm. in diameter, ulcerated on the surface. There are palpable glands in the left submaxillary region.

Clinical Diagnosis—Carcinoma of the lower lip.

Operation advised. Referred to the Mass. General Hospital.

Operation—M. G. H.—December 4, 1922. A complete dissection was made of the submental and left submaxillary regions. The growth on the lip was excised by a V-shaped incision.

Pathological Examination—Carcinoma of the lip. No carcinoma found in the glands of the neck.

Three Year Result—Patient writes—November 1925—that he has had no further trouble with his lip.

Comment—Although the glands removed from the neck showed no cancer, dissection of the neck was justified because of the two local excisions and recurrences and because of palpable glands. Experience shows that there is a larger percentage of cures in patients who have had the double operation, i. e. lip and neck. Frequently we see patients in our clinics who have had lip operations, without neck dissections. The patients do not realize that their swollen glands are related to a lip lesion removed months or years before and they therefore delay until operation is out of the question.

CANCER OF THE RECTUM

Mr. P., age 51, entered the Pondville Hospital on March 24, 1928, with an inoperable carcinoma of the rectum.

Present Illness—Onset October 1927 with obstipation, dysuria and abdominal cramps. Some pain in rectum. No blood in stools. Patient went to a doctor shortly after onset and was told he had appendicitis. He went to a second doctor who gave him stomach medicine and a tonic. He then went to the Out-Patient Department of a Boston hospital where he was put on a diet. He made three visits to this hospital before he was seen by a doctor who found a growth in his rectum. During all the time from October to February he did not have a rectal examination.

He was sent to the ward and operated on. A large, inoperable carcinoma was found at the recto-sigmoidal junction. A colostomy was made through the left rectus muscle. As soon as he was able to leave the hospital, he was sent to Pondville for radium.

His chief complaints now are poor appetite, indigestion, a muco-purulent rectal discharge and nocturia four to five times. He has lost fifty pounds in six months.

Family History—No cancer in family.

Marital History—Wife and two children living.

Past History—No serious illnesses.

Physical Examination—Patient is extremely emaciated and weak.

Teeth carious and dirty.

Heart—sounds normal. Pulse rapid but regular. Blood Pressure 110/70.

Abdomen—Left rectus colostomy functioning well. Liver and spleen not palpable. Healed midline operative scar. Transverse colon filled with semi-solid feces and easily palpable.

Inguinal glands enlarged.

Rectal—Hard mass felt at the tip of the examining finger. The proctoscope shows the rectum to be practically occluded. There is infiltration of the anterior wall in the region of the prostate and the tumor cannot be removed.

Outline of Treatment—

1—Regulation of bowels to insure proper functioning of colostomy.

2—Cod liver oil to improve general condition until it is possible to move patient out in sunshine daily.

3—Deep X-ray treatment to pelvis.

4—Implantation of radium into rectal growth under spinal or sacral anesthesia.

Prognosis—For cure, hopeless. For relief, slight.

Comment—This man's chances of cure from cancer were lost by the negligence of three physicians to make a careful rectal examination.

CANCER OF THE CERVIX

Mrs. B., age 68, entered the Collis P. Huntington Hospital on March 15, 1928. She had been seen by a surgeon who stated that she had an inoperable carcinoma of the cervix.

Present Illness—One year ago she began to have a bloody vaginal discharge. She had no pain until December 1927 when she sent for her physician. He referred her to a surgeon who in turn refers her for radium treatment.

Past History—Negative.

Marital History—Married. One child.

Family History—Father died of carcinoma of the liver. No tuberculosis in family.

Local Examination—Vaginal examination shows a contracted vagina with carcinomatous infiltration of the anterior and posterior walls. Ether examination was advised and done on March 17. Examination at this time showed an extensive infiltrated tumor of the anterior and posterior vaginal walls nearly obliterating the vagina. There is a large crater replacing the cervix. It is about 1½" in diameter. By rectum the rectal-vaginal septum is infiltrated. The uterocervical segment is firmly fixed on both sides. Diagnosis of very extensive carcinoma of the cervix was made. Radium was given with the idea of stopping the bleeding but without any hope of cure.

Radium Treatment—537 mcs. in 2 mm. lead cylinder was packed into the crater replacing cervix. Eight gold "seeds" of 1½ mcs. each inserted into the anterior and posterior vaginal walls.

Pathological Report—Squamous cell carcinoma. High malignancy.

Prognosis—Very bad. Patient is very likely to develop fistulae into the bladder and rectum. Duration of life—six to eight months.

Comment—It has been shown in this clinic that in early cases each month of delay reduces the patient's chances of cure 16%.

CANCER OF THE CERVIX

Mrs. D., age 50, was admitted to the Huntington Hospital on February 15, 1923, complaining of vaginal bleeding irregularly for one year.

Present Illness—She had her menopause five years ago and had no bleeding for four years. One year ago she noticed a white discharge which later became bloody. Her physician has been giving her antisyphilitic treatment for several months but had finally suspected cancer in addition to syphilis. He removed a specimen which was reported to be cancer and referred her for treatment.

Marital History—Married. Four children alive and well. The last three children have all died in infancy.

Local Examination—Under ether. There is an ulceration at the apex of the vagina which has destroyed the posterior lip of the cervix and which extends into the uterine cavity. The posterior vaginal wall is involved in an ulcerated mass. Diagnosis—carcinoma of cervix involving vaginal wall,—proven by pathological examination.

Radium Treatment—Under ether. Three steel tubes containing 310 mcs. of radium were inserted into the cervical canal and left for eight hours. Seven glass "seeds" containing from 1½ to 2½ mc. were inserted in the periphery of the cervix and left indefinitely.

Further Notes—Patient reported for examination

every three months for one year. She had no pain or other symptoms from her treatment. She was then lost sight of for about two years when she returned for examination. Examination in February 1926 showed nothing suggestive of disease. Patient is perfectly well and has no symptoms.

Comment—This patient is classed as a three-year cure. She may develop a recurrence, but at present she is free from disease.

MELANOTIC SARCOMA OF CHEEK

Mrs. C., age 64, entered the Collis P. Huntington Hospital on March 16, 1928, with a lesion on the right cheek.

Present Illness—For many years there has been a small, smooth, brown patch on her cheek. Two weeks ago she irritated it with her face cloth. Since then it has itched and become raised from the skin, getting steadily larger.

Local Examination—In the center of the right cheek there is a raised, brownish nodule, 2 cm. in diameter, with a superficial scale. No palpable glands.

Clinical Diagnosis—Melanotic sarcoma.

Treatment—On March 17th operation was done with the electrocoagulation machine. A wall of coagulation was made in the healthy tissue around the tumor. With the cutting electrode, this coagulated tissue was then cut through and the growth removed. The edges of the wound were sutured together loosely.

April 6—Healed.

Pathological Report—Melanotic sarcoma.

Outline of Further Treatment—Melanotic sarcoma metastasizes either to the lungs or to the glands. If the former has taken place, there is no treatment which will help. There is no glandular enlargement now. Patient to be watched for glands and neck dissected if they appear.

Comment—This was a type of pigmented patch which lay dormant for years, only to start a very rapid growth. Any mole or pigmented area which shows any tendency to become irritated or to change in character should be removed at once.

CANCER OF THE BREAST

Mrs. M., age 61, entered the Pondville Hospital on July 2, 1927, with recurrent carcinoma of the left breast.

Present Illness—In December, 1925, she noticed pain in her left breast around the nipple. She consulted her physician in March, 1926, and a diagnosis of cancer of the breast was made. She was sent to the hospital at once and a surgeon amputated the breast and dissected the lower axilla, but did not remove the pectoral muscles. She was all right for six months when she noticed a mass in her left axilla. In November 1926 another surgeon removed this mass, together with a portion of the muscles. There was no further trouble until February 1927, when a nodule appeared in the upper portion of the scar. In April this broke down and new nodules appeared in the scar. Since then she has been having severe pain.

Family History—No cancer in family.

Marital History—Husband and one child living.

Past History—No illnesses.

Physical Examination—Negative save for local examination.

Local Examination—Left breast has been amputated. Pectoral muscles have been partially removed with the contents of the axilla. There are four, hard, nodular recurrences, one freely movable one in the scar, one deeply fixed at the apex of the axilla and two others lying directly below these two. These nodules vary from 3 to 5 cm. in diameter. The right breast is normal. No glands in the right axilla or above the clavicles. No suprasternal increase in dulness. Diagnosis—recurrent carcinoma of the breast.

Treatment—July 11, 1927. Four 12.5 mg. radium needles were inserted directly into the four nodules and left for 8 to 10 hrs.

July 18, 1927. Five platinum implants, each containing 2.3 mc. radium emanation were inserted into the tumors.

August 15, 1927. Five glass radium seeds.

August 30, 1927. Eight gold radium seeds.

Sept. 7-11. Deep X-ray treatments.

Nov. 7, 1927. Readmitted. Marked diminution of all the nodules seen at admission but there are numerous other nodules needing treatment.

Nov. 9. Ten gold radium seeds.

Nov 15-19. Deep X-ray treatments.

Jan. 8, 1928. Readmitted. Marked edema of arm. Axilla filled with tumor tissue.

Jan. 16. Twelve gold radium seeds.

Jan. 23-27. Deep X-ray treatments.

In August and again in January the X-ray showed no lung metastases. X-rays in January of all her long bones, pelvis, and spine showed no metastases. She returned home on February 4 and died on March 12. Immediate cause not known.

Comment—A type of carcinoma which never showed any tendency to metastasize outside of the local field. This type should be cured by radical operation,—removal of the breast and overlying skin, the underlying fascia, the pectoral muscles and the axillary contents. In this case the radical operation was not done at the first operation. Secondary operations are rarely successful.

CANCER OF THE BREAST

Mrs. O., age 58, entered the Huntington Hospital O. P. D. on March 27, 1928, with a lump in her left breast.

Present Illness—In May 1927 she noticed a lump in her breast. It did not pain her so she did not consult a doctor until one week ago. For the last few weeks there has been some discharge from the lump. She now has "rheumatism" in her left leg and in her back.

Past History—Negative.

Marital History—Husband and four children alive and well.

Family History—No cancer or tuberculosis.

Local Examination—There is an irregular mass occupying the whole left breast and spreading through the skin in the posterior axillary line on the left to the right margin of the right breast, involving all the skin between these points, upward to the clavicle and downward to the costal margin. There is extensive glandular enlargement in both axillae, none above clavicles.

Clinical Diagnosis—Carcinoma of breast (en cuirasse).

Plan of Treatment—When patient enters the hospital X-rays of her chest, spine, and long bones are to be taken. Her "rheumatism" is suggestive of bone metastases. She will then be given deep X-ray treatments.

Prognosis—Hopeless for cure. She may get rid of her discharge by treatment and her life may be somewhat prolonged.

Comment—This patient had never learned that the time to deal with a tumor of the breast is before it gives her pain. Ten months' delay of course is fatal.

CANCER OF THE BREAST

Mrs. T., age 46, entered the Huntington Hospital on December 31, 1918, with a lump in her left breast.

Present Illness—She noticed a lump in her breast

ten days ago. She consulted an osteopath who advised operation.

Past History—Abscess of breast opened four years ago. The present lump is at the site of the old operation.

Marital History—Husband and two children living and well.

Family History—No cancer or tuberculosis.

Local Examination—Both breasts are large. Right nipple normal. Pressure on left breast causes the nipple to retract. Above the left nipple there is a deeply situated hard new growth 2 cm. in diameter. There is a suspicion of pigskin. No adherence to the muscle. No glands in axillae or above clavicles. No discharge from nipple. Diagnosis—carcinoma of breast. Operation advised.

Operation—January 6, 1919. The left breast with the pectoral muscles, the skin over the breast and the fascia beneath the breast and the contents of the axilla except the axillary vein were removed. The skin flaps were completely closed.

Pathological Examination—Carcinoma of the breast. No cancer in the glands.

January 6, 1925—Patient writes that she is free from disease. It is six years since operation.

Comment—There was no delay in this case. Axillary glands were not palpable and were not microscopically abnormal. Prognosis for complete cure excellent.

THE WEEK'S CANCER PROGRAM AND THE OPENING EXERCISES IN SYMPHONY HALL, MONDAY, APRIL 23

THE State-wide campaign for the control of cancer was inaugurated April 23 to extend through the 27th. The first exercise was a luncheon at the Hotel Statler for the professional group at which Dr. William A. Evans of Chicago was an especial guest.

The first general meeting open to the public was in Symphony Hall on the evening of the 23rd. The program follows:

Organ Prelude ..... Mr. Clair Leonard
Introduction and Allegro
Handel's concerto No. 10

Music ..... Led by Mr. Russell Cook
America the Beautiful
(By the audience)

Presiding—Robert B. Greenough, M.D.
Regional Director American Society for the Control of Cancer

Introductory Remarks ..... Governor Alvan T. Fuller
Mayor Malcolm E. Nichols
Rev. Father George P. O'Conor
(representing Cardinal O'Connell)

Address: "Cancer Control" ....William A. Evans, M.D.
Professor of Public Health, Northwestern University, Formerly Health Commissioner of Chicago.

Address: "Social Problems of Cancer" .....
..... Richard C. Cabot, M.D.
Professor of Social Ethics, Harvard University

Motion Picture: "A Fortunate Accident"

Organ Postlude ..... Mr. Clair Leonard
Toccata in F
Widor's Sixth Symphony

In introducing His Excellency Governor Fuller, who was the first speaker, Dr. R. B. Greenough said:

Ladies and Gentlemen: This is the first exercise of a State-wide campaign to diminish the number of unnecessary deaths from cancer, and it is supported by the Government, the State Legislature acting chiefly through the State Department of Health, by the organized medical profession as represented by the Massachusetts Medical Society and by the public itself as represented by that organization of laymen and physicians which has done so much to disseminate knowledge of this disease, the American Society for the Control of Cancer, as represented by its Massachusetts Branch. While these organizations are primarily the sponsors for this campaign, the Catholic Church, the Protestant churches, the Jewish churches, the hospitals, the innumerable social agencies which know so well the need for public education on health matters, the daily press, the radio broadcasting agencies, and individuals and organizations which have contributed time, money and energy to the success of this campaign, and most notably those distinguished representatives of our State and City government, the eminent representative of the Roman Catholic Church and these nationally renowned authorities on medical and social science have generously come to our help in this emergency.

It gives me great pleasure to introduce to you a statesman who by his courage, his honesty and his intelligence has honored the exalted position of Governor of the Commonwealth of Massachusetts as much as that position has honored him—Governor Fuller (applause—all stand).

Governor Alvan T. Fuller spoke as follows:

Doctor Greenough, the Mayor of Boston, Father O'Conor and fellow citizens:

Ten months ago we met to open a Massachusetts State hospital at Norfolk for treatment of patients in all stages of cancer. That hospital is giving excellent service and turning three patients back into the community relieved for every one that dies. At that time it was pointed out that the State hospital's service would always be largely alleviative and that we must look to the doctors and the clinics to decrease our dreadful death rate from this disease. The State-aided clinics served 1300 persons last year, and since then new clinics have been opened so that at present twelve cities hold regularly such cancer clinics and others will soon be added. This year as many as ten thousand persons should visit them.

Thus it is particularly suitable that organized government, the organized public and the organized profession should unite in a cancer cam-

paign. These great forces are represented by the State Department of Public Health, the American Society for the Control of Cancer, and the Massachusetts Medical Society, and they call on all of us adults as good citizens to co-operate.

I am told that one in every ten adults now living in the United States is doomed to cancer, that the disease claims as its victim one in every eight men between the ages of 55 and 70 and one in every five women between the ages of 45 and 65. The world has never known a more ravaging disease than cancer, and the toll that it takes is increasing every year.

The mere fact that cancer is a disagreeable subject to talk about should not keep us from giving it intelligent consideration which will make for curbing its ravages. Massachusetts is the first State in the Union to have a cancer hospital and to establish cancer clinics paid for out of public funds. The object of this meeting is to see that these facilities are utilized by those afflicted with cancer in the early stages. Therefore one of the primary objects of these meetings, which are being held throughout the State under the direction of the Department of Public Health, is to educate the public to the first indications of possible cancer in the hope that they will go to one of these State clinics and there receive expert advice free.

There is something very insidious about cancer. I hesitate to make a personal observation, but from early youth it to me has been one of the most dread diseases, and I have observed that people are very reluctant, even when they have some ailment that might possibly be cancer or a start of it, to have a diagnosis of their trouble made. They seem to feel that there is a stigma attached to having this disease and a good many people, it would appear, are secretive in regard to symptoms that even remotely suggest the possibility of cancer. I have known of cases where people have hesitated to have an examination made for fear that a proper diagnosis of their case would indicate that they had cancer. Apparently there are those in the community who hesitate to bravely face a diagnosis as some people dread to contemplate the making of a will. This is very unfortunate. It is a great mistake. I think that doctors will agree that if this unintelligent way of doing things could be cleared up, it would be a great help. Cancer is bad enough without having the people afflicted with it conspire with the dread disease itself to aid in its progress.

I have been told that ninety per cent. of the cases of cancer of the skin are curable. It is well to keep in mind that cancer is not hereditary; it is not contagious; it is not infectious. I am very sure that the people of Massachusetts, as they become familiar with the data, facts, and statistics that have to do with cancer, will take pride in the fact that Massachusetts is in advance of the other States in the Union in preparing to restrict the inroads of this disease.

But the point we want to drive home is this. We have not really accomplished anything—or a great deal at any rate—until we disseminate the information that will lead people when in doubt, or with the slightest suspicion that they have an infection that might develop into cancer, to take advantage of the clinics or the hospital. The clinics are located in the various cities and the cancer hospital is at Norfolk.

I am very sure that Dr. Bigelow will be glad to have any suggestions that might occur to you in connection with this cancer campaign. The State work in this connection is new; it is pioneering work; and the best ways are not charted; and therefore if the public can offer any suggestions that will help, I am sure they will be very acceptable.

I call on you, then, at the opening of this carefully organized cancer campaign, to make full use of the lavishly free opportunities to inform yourselves regarding the proper use of the resources for cancer control, to the end that each of you may contribute his share toward what will perhaps be one of the greatest monuments to a free, educated people, the reduction of the present dreadful toll of cancer deaths.

In introducing Mayor Nichols Dr. Greenough said: The City of Boston like the Commonwealth honors us by the presence of its chief executive. He has shown by his conduct of municipal affairs especially in the health department under Dr. Mahoney the desire to procure a healthy as well as an educated and an orderly and happy community. I introduce Mayor Nichols (applause, all stand).

Mayor Nichols: It is fitting that the city of Boston be represented on the program this evening. For many years Boston has been one of the prominent medical centers of the country and is now developing into what may soon be the leading one. The medical profession of Boston has always been interested in cancer, and this interest was intensified in 1901 when the Cancer Commission of Harvard University was established. From that time to the present various forms of research work have been conducted and the reports from the Huntington Memorial Hospital are valued throughout the Scientific world.

At the present time there are many agencies and institutions in Boston that are dealing with various phases of the cancer problem. It would be impossible to name them all, but reference of them seems pertinent.

The Huntington Memorial Hospital in addition to doing research work makes diagnoses and treats a large number of cancer patients. There are a few beds here for patients needing house care.

For many years the Palmer Memorial Hospital has cared for cancer patients. Within the past year this hospital has increased its number of beds by building a new hospital. Here the

most approved service is available for all type of cancer cases.

The Good Samaritan Hospital furnishes nursing care for terminal cancer cases among women.

The Massachusetts General Hospital has opened a tumor clinic for the diagnosis of malignant disease.

The Boston Dispensary conducts a cancer clinic and furnishes radium and X-ray treatment for those needing it.

The Boston City Hospital and the Long Island Hospital furnish care and treatment for cancer cases.

The Boston Health Department is coöperating with the State Health Department in its program of Cancer Control.

The Community Health Association is furnishing nursing care to many cancer cases.

During the past year an extensive survey has been made to determine what the needs are in Boston for the chronic sick.

The above items list only a few of the services available for cancer patients. There are probably few cities in the country which have taken the interest in cancer to the same degree as has Boston.

But to have these and other resources available is not enough! They must be used. To this end the cancer campaign is devoted, and to this end the public must avail themselves of the unprecedented resources for informing themselves regarding the control of cancer.

In presenting Father O'Conor, who represented Cardinal O'Connell, Dr. Greenough said: One of the most staunch supporters of any movement to increase the health and happiness of mankind is the Roman Catholic Church, and in the health education and especially in regard to cancer Catholic institutions, hospitals and churches have been freely open to the dissemination of knowledge in regard to this disease. The Holy Ghost Hospital in Cambridge is one of the first hospitals established in the State especially for advanced cases of cancer. The Daughters of Isabella have aided in no slight degree in the education of the public in regard to this disease.

His Eminence, Cardinal O'Connell, was unavoidably prevented from attending this meeting but he sends a worthy representative in the person of Father George P. O'Conor with a message which will be of interest to you—Father O'Conor. (Applause.)

Father O'Conor said: Distinguished Ladies and Gentlemen: It is with great regret that I announce the inability of Cardinal O'Connell to be here tonight. He directs me to express to Dr. Greenough and to all the gentlemen who are interested in this great campaign of cancer control in Massachusetts, to express to them his deep and abiding interest in all they are endeavoring to do. In his administration of our many large institutions Cardinal O'Connell has come in contact with every phase of cancer and therefore he is most anxious to do everything that is possible to alleviate the suffering that it causes.

Now, Ladies and Gentlemen, mere sympathy though it comes from the finest personal motives will never bring emancipation from this dread disease. We need sound thinking, we need courage, scientific methods, intelligent coöperation, if we are to emancipate the people in this part of the world from that dread scourge. And the coming together of the public and private agencies with a real program for the development of successful effort against this disease is one of the finest and greatest movements that has taken place in this State for many a day.

Now the Catholic Church, which I have the honor to represent tonight, offers an unfaltering loyalty to this program in behalf of cancer control. She sends forth her people as an exemplification of the Christian law which makes the strong go forth to seek their sanctification or holiness in the service of the weak; and a better understanding in the community of the law of Christian charity or Christian brotherhood will do more in giving a source of strength to any movement of this kind that is for the welfare of humanity.

There is a trend at the present time toward larger associations, toward mutual discussion on the part of those who are doing the same sort of work. There is a coöperation today amongst agencies that are interested in like pursuits, and this will bring forth a great stimulation. This will surely bring success because it is in this mutual discussion and this fine coöperation that anything worth while will be accomplished. Isolation of any group in a community always impedes progress because that group will offset some of the great efforts that are being made for the benefit of the community as a whole.

We understand from the past war what coöperation meant—how it developed great efficiency, how this nation went forth in an almost irresistible manner because everyone worked together in order to accomplish the great result that was at hand. I think we might pledge ourselves here tonight in a personal way in behalf of the thousands of men and women who are suffering now and who will suffer in the future from the disease, cancer.

Some years ago a gentleman gave a million dollars to an institution that was built for the benefit of wayward boys. At the dedication of a building erected to his generosity he gave an address and in his address he said that this institution was worth a great deal of time or rather that it cost a great deal of time and labor and money, but, he said, it is worth all the time and labor and money spent if it saves one boy. Afterward a friend of his said, "Didn't you make that a little strong?—that this institution is worth all the time and money and labor if it saves only one boy?" and he said, "Oh, no, I didn't make it too strong. This institution is

worth all the time and labor and money spent if the only boy saved were my boy." And Ladies and Gentlemen, in the great work against cancer let us take a personal interest, let us think of each one of the thousands who are afflicted with this dread disease. Let us by this personal interest go forth as an irresistible force in overcoming this dread disease. Let us help to rob it of the terrors with which it has afflicted our community. It will mean something for us as American citizens because I think it is fine always to think of American citizenship as a citizenship which always shows true charity and a great interest in the less fortunate of our fellow men. And we pledge ourselves tonight with a sacred and sincere loyalty that our blessed country may renew admiration among the nations of the earth because she is now as she always has been, a representative of active Christian work in the service of mankind. (Applause.)

Introducing Dr. Evans Dr. Greenough said: Ladies and Gentlemen: There are few physicians in this country or in the world whose names are so widely known, whose advice is so widely followed, and whose influence for the betterment of the race is as great as that of Dr. William A. Evans of Chicago. He contributes those daily health talks that are read in the daily press from Massachusetts to California and from Maine to Florida. I suspect that Dr. Evans is in reality not just one superman but 20 at least, but in any case he is a distinguished professor of public health in Northwestern University in Chicago, and he or they have come all the way from Chicago to talk to you tonight —Dr. Evans (applause).

Dr. William A. Evans, Chicago, said: Mr. Chairman, your Reverence, your Honor, Dr. Greenough, Ladies and Gentlemen: I am very happy to be here tonight. We have done nothing, practically nothing, for the control of cancer in Illinois, certainly we have done nothing worth while in a collective way. I am very anxious that the story that I take back to my people will be of some service in interesting them and I hope the time will come—and that not far away—when we in Illinois will inaugurate a campaign fashioned after your campaign and with the same objective. It will not be the first time. It is not often that men and women gather together under circumstances such as these. I have been present at the launching of more than one health campaign of one sort or another in more than one State of the Union, but I do not recall an occasion when the Governor of the State, the Mayor of the City and the ranking officer of the Catholic Church were represented or in person on the platform, giving sanction and approval to that which was being undertaken. Nor is it usual; in fact I do not remember ever to have been present in the very inauguration or beginning of a campaign in which there was such a large representation of the general public as we have here tonight.

You understand that this thing has not the force of years. It isn't a going concern. Less than two years of age in your own community, and with no background of experience in surrounding communities, you are participating in the birth of the thing. There is a degree of enthusiasm and interest in the people here that is unusual in the beginning of anything. Your city has the reputation of some degree of aloofness. If I reason this thing aright I am bound to arrive at one or two conclusions:—either you have a larger measure of human sympathy in the men and women who go down under cancer than is present in other communities or than is manifest in other communities, or else you have a vision and imagination and capacity to foresee the future that does not prevail in other communities, and perhaps there is in the interest that you manifest a mixture of these two motives.

We have just had two very good medical talks, one by the Governor and one by the Mayor. They made such excellent medical addresses that I believe I am released from obligation to talk like a doctor, and they have earned for me the privilege of talking like a plain citizen, like a layman, like one of you.

This campaign is a conflict with a disease against which men have mixed emotions. There are those here and there are more who are not here who are dubious as to the advisability of undertaking a cancer control campaign. And this doubt relates to two groups: one, the individual or from the standpoint of the individual, and the other from the collective or community standpoint. I am going to call your attention to a certain similarity between cancer and consumption, a similarity between these diseases as they relate themselves to individuals and as they relate themselves to communities. I am going to ask you to walk with me down the paths which men have traveled in reaching the point where they now are with relation to consumption. I am going to measure that with which you hope to have experience by the measure of the experience that you have had. I am going to ask you to determine what will be your attitude toward cancer on the basis of your experience individually and collectively with consumption. There are those who hesitate to have attention drawn to cancer because of the unpleasantness of it, because of the sorrow that the word denotes, because of the unhappiness that has been brought into the lives of men. It is one of those disagreeable things that superficial thought and superficial thinking would have us avoid. I want to call your attention to the fact that from the standpoint of the individual this was just our attitude toward consumption 25 or 30 or 40 years ago. We dreaded to tell a man that he had consumption for it meant nothing but sorrow and hopelessness. But that which I want

you to take cognizance of is that a policy of frankness, openness and honesty, has worked to benefit mankind. Individuals who now have consumption have a better opportunity to escape the thraldom of that disease by reason of the fact that consumption is no longer avoided as a thief, that it is spoken of honestly, and diagnoses of consumption are honestly given and honestly received, that the policy of secrecy and evasion, of covering up, has given place to the policy of plainer speaking, and this has worked to the advantage of the individual who has consumption. He is better informed, he is more alert, he better understands the meanings of certain things that point the way than he ever would have been under the old policy; and an indirect working of that policy has been the hope that has been substituted for hopelessness, that something has taken the place of despair that once prevailed.

And again with respect to the community—why is the community interested in the policy of cancer control? It has become one of our most important diseases. It is one of the larger problems of departments of health. If those departments of health are to protect their communities against preventable disease, they cannot logically escape the obligation to do something for the control of cancer. Statistically and in all other ways it represents one of their larger and more important problems, and the only question is—Shall they frankly face conditions as they are, or shall they shy off and leave to another or to another day the solution of this exceedingly trying and difficult problem? There are those who would have men leave for the morrow campaigns against cancer, and they belong in several groups, and I propose asking you to continue your attention to the history of consumption, to learn from that history what there is that can be of help in a campaign against cancer.

In the first place, let us very frankly recognize the fact that there are great forces and great influences that would have us leave the subject untouched and even unreferred to. Within two weeks, certainly within a month, a great newspaper refused to open its columns to discussions of cancer, because they said there was nothing to offer—it brought nothing but sorrow and pain, there was no way out, there was no reason for hope, there was nothing pleasant that could be said, there was nothing hope-inspiring that could be said—and they declined to offer or open or make available their columns for things that represented nothing but sorrow.

Not dealing particularly with this subject but with a subject somewhat allied, I talked with Mr. O'Brien of the Herald two or three years ago; I told him of a conversation I had a few years before with Mr. Bok, editor of *The Saturday Evening Post* and of the *Ladies' Home Journal*, and he said he felt it was the duty of the newspapers with which he was connected to undertake discussions of delicate and trying subjects in the columns of those newspapers. He realized the fact that discussing those subjects in those particular newspapers would mean a loss of subscribers. He took the matter up with Mr. Curtis, the owner of the publications, and he said "In my judgment a considerable number of people will cancel their subscriptions if we frankly discuss those subjects in the columns of these papers," and Mr. Curtis said "Is it worth while?" and Mr. Bok said "It will be." "And if that be true," said Mr. Curtis, "let us go on with the campaign; we will take care of the people who cancel, we will take care of the interests of the *Journal*." They proceeded with the policy they determined on, and he said that within a month 30,000 subscribers had cancelled their subscriptions, but within two years there had been enough gain in circulation to more than offset the 30,000 who had cancelled. I discussed this matter with Mr. O'Brien, and he said that so far as the *Boston Herald* was concerned, that if the matter was of public concern, he would discuss it freely and frankly and take care of the interests of the paper.

There is another group of people, and among them health officers, who are doubtful about the advisability of undertaking a campaign for the control of cancer because of the fact that we have no specific for the cure of the disease and we have no vaccine by which the disease can be prevented, and being so poorly equipped, they hesitate to give their approval, they hesitate to undertake campaigns for control. Every health officer is confronted at times with the necessity of making decisions on matters of this sort.

I remember very well when it became necessary as health commissioner of Chicago for me to decide what I would do about consumption. I studied the death rates from that disease for about 50 years prior to the time when I had this decision to make. I found that in 1902 our death rate from the disease consumption had ceased to decline. It had reached the standstill and more than that it had somewhat increased. To my mind it became necessary to do some things in addition to the things that had been done, and I decided on three procedures:—one, to require the compulsory pasteurization of milk, and the other to require the registration of cases of consumption with visitations by nurses and others in their homes, and third, the erection of a sanatorium and a building up of a sanatorium and clinic system.

Before beginning this I submitted the matter to the judgment of a friend in whom I had great confidence, a former commissioner of health of Chicago, and he advised me not to undertake it. He said "we have no weapons against consumption." Mind you this is more than 20 years ago, and we stood with relation to consumption where we stand against cancer now. We have no specific for the cure of the disease. We have no prophylactic or vaccine by which the disease can be prevented. To speak of it is to do nothing more than bring human sorrow; to speak of it is to

do nothing more than to bring despair and fear and anxiety to men and why undertake it since you have nothing to offer?

In spite of that advice we launched a consumption campaign, and I am going to tell you something about that now. I am going to make use of the experience of Chicago, not that there is anything peculiar there, not that there is anything that has been done in Chicago but what might have been done and better done in Boston, it happens to be the experience with which I have had some contact and concerning which I can speak with some authority.

Our first knowledge of consumption in the State of Illinois was about the year 1850. About that time Daniel Drake, one of the greatest characters American medicine had produced, journeyed from his home in Cincinnati to Illinois. He went up the Mississippi River to the Illinois and up the Illinois River to Chicago, and when he arrived he wrote back to his magazine in Cincinnati "from Jacksonville to Joliet I have been told that there is no consumption in Illinois; that it is free from the disease; furthermore those who come here with the disease find a haven and an escape from their disease." He proposed that the claims of Illinois be seriously studied, claims that Illinois was entitled to be a resort state.

Almost constantly prior to 1870 I find in the medical literature of that region reference to the fact that there was no consumption in the upper Mississippi valley except among the people who had gone there from New England and had taken the disease to their new homes in the Mississippi valley. That was the prevailing opinion, and almost innumerable opinions to the same effect might be cited.

Now what are the facts? The fact is that when the record first became available we had a death rate in Chicago and in the vicinity thereof of 300 (300 per 100,000)—but forget the standard of measurement and carry the figure 300. 300 represented the consumption death rate at that period in our history when our doctors weren't informed, when everyone was saying that consumption was of no consequence. There was no consumption problem as they regarded it then in the State of Illinois. There was the death rate. By 1902 this death rate had been cut approximately in half. It was 150.

Now what had brought that about? I termed that the period of indirect effort. It was the period in which we had no armamentarium for fighting consumption. We had no specific to cure it, no vaccine to prevent it, no hospitals in which it might be cared for, no sanatorium, no preventorium, no equipment whatsoever. Seemingly in the face of the disease society lay helpless. And yet by 1902 this rate had been cut approximately in half, and how? By campaigns of education, by propaganda, by elevation of the standards of living, better wages, more expenditure on the home, better homes, better working places, better habits, better customs, more food and better food;—by such indirect efforts as these, supplemented by frank speech, supplemented by the spread of intelligence by the spoken word, nothing more than campaigns of education and propaganda the death rate from consumption had been cut in half.

Now will you think of this if you please—at no other period has there been so great a reduction in the consumption death rate as there was when without equipment, no vaccines and no specifics, no antitoxins, no hospitals, no sanatoria, no preventoria, when the only possibility of improving conditions was by appeal to the intelligence and to the interests of the people—in no other period has there been so great a numerical reduction as there was in that period.

In 1907 without abating any of the earlier efforts, by continuing all of the things that had been done we added thereto certain direct efforts for the control of the disease. We had heard of the efficacy of the hospital and of the sanatorium and of what could be accomplished by tuberculosis dispensaries and by nursing service, and we knew what could be done by the pasteurization of milk and by the registration of consumptives and by appeal direct to the consumptive himself; and by that line of policy which we term "direct effort" in addition to that which had been done in an indirect way we effected a further reduction of about 50 per cent.—in round figures from a rate of about 150 to a rate of about 75; and that was a reduction of 75 points as compared to the earlier reduction in that prior period of 150 points as a result of the application of direct measures of control in addition to the measures of indirect control to which your attention has been called.

Now we stand under the necessity of making another decision. It is my judgment that the time has come if there is to be further improvement, further reduction of the consumption death rate, it is necessary that there should be the addition to our armamentarium of specific measures directed at the disease, specific substances similar, if you please, to the antitoxin for diphtheria, similar, if you please, to the vaccine for smallpox; and if we are to have a further material reduction in our consumption death rate, we must at about this period enter upon a third period, a period of specific action.

Now note, if you please, this division into periods. The first is the period of indirect action, and then the period of direct action, and now it is proposed a period of specific action for which I sincerely trust our bacteriologists and laboratory workers will present us with the arms of offense and defense of which we are in need.

Now how does this apply to cancer? How does this story dovetail in with cancer? You have been kind enough to walk down the corridors of time and experience we have traveled in

reaching the period where we now are in the control of consumption, and it has been worth while. The results which have been accomplished have justified the expenditure of money. The results which have been accomplished have justified every statement, every promise, that was held out when the campaign was being launched something more than a quarter of a century ago. I believe with respect to cancer we stand where we stood with respect to consumption some 25 years or more ago. I believe that the campaign against cancer will be aided by indirect efforts, education, propaganda, if you please, and campaigns having as their purpose stimulating the interest of the people, informing them of the facts about cancer. I listened today to a talk by the Chairman of the evening and I wish you could have all heard that talk and gathered from the speaker of the occasion the facts that are now at hand, that are available for use against this disease. It is true we have no antitoxin. It is true we have no specific. But we do have more of the facts and more of exact information about cancer than we had about consumption when we were beginning some 25 or 50 or more years ago. A campaign that tends to inform people as to what should excite suspicion, what should cause investigation, a campaign that would cause men to avoid all those things which make for cancer and that would stimulate those habits and customs that antagonize cancer would attain something of progress comparable to the gain made against consumption.

We are somewhat more advanced than at the period when we launched our campaign against consumption. You have heard from your Governor and from your Mayor that you are engaged in direct effort. You have cancer hospitals dotted over the State of Massachusetts where cancer clinics and dispensaries and cancer nursing services are available; in other words, you stand midway between those two periods. You are going on with your work of propaganda and education, and simultaneously therewith you are providing the same type of institution fitted for the needs or control of cancer that have been found effective against consumption.

And now there is the story. We are merely asking you of the State of Massachusetts, we are merely asking you to lend your support of interest and of money, your support as citizens, to the same kind of campaign that has demonstrated its effectiveness in the control of consumption, and it has proven worth while with consumption. It has there demonstrated that men may not see, that men may not easily previsage or understand, men may not clearly comprehend the ends. The facts flow in ways that men cannot understand; and that is all that we are asking, and I am sure that the intelligence of this community will respond to the asking and that you will travel the path for the control of this disease that experience has proved to be the proper path in the control of its companion disease.

The responsibility isn't yours alone. You are not deciding alone for the people of Boston and of the State of Massachusetts. As you decide, so your decision will be in other States of the Union. As you succeed, there will be other States and communities that will follow in your footsteps. That which is undertaken here tonight, that which is launched here tonight, and that which will be presently done in Massachusetts will have a hearing which will radiate to other lands until the world has been belted around. (Applause.)

In introducing Dr. Cabot Dr. Greenough said: We had to go as far away as Chicago to find an authority to talk to us on the public health aspect of cancer, but for one to talk on the social aspects of this disease we come nearer home. I am willing to believe that the gentleman I am about to introduce discovered social ethics. I know he discovered social service for I saw him often during the period of its gestation. I introduce Dr. Richard C. Cabot. (Applause.)

Dr. Richard C. Cabot said: Mr. Chairman, Ladies and Gentlemen: I have one advantage tonight over most of the speakers who preceded me. They have been doing the work of this campaign, to them is due the credit of all this. Therefore they couldn't so freely as I can, praise what has been done in this campaign.

The hospital at Pondville for cancer is one which anyone who knows hospitals would recognize at once as belonging almost in a class by itself. I have lived in hospitals a considerable fraction of my life. I know hospitals in this and other countries, and when I went to visit our State hospital for cancer, I said to myself beforehand, "now those people are tackling one of the hardest problems that has ever been known to be tackled." They are having their courage with them, for a hospital for cancer would be a place hard to make human, cheerful and encouraging. Think of what it means—a hospital for this terrible disease. So I expect to see a place where people had done their best in overcoming discouragement. Now to my surprise and delight I found that hospital not only no more discouraging than most hospitals; it seemed to me the atmosphere there of hope and courage is superior to that I have ordinarily seen in that of general hospitals in this and other cities. Now, Ladies and Gentlemen, let me tell you that that is an extraordinary feat.

Pondville is in a sense the center of this campaign but it is only one part of it. The speakers have referred to the different clinics for cancer scattered over the Commonwealth. The hospital alone cannot meet all the demands of the problem though the hospital can do much. What has made this hospital? What has given it the qualities I have alluded to? A number of elements have conspired to that end. In the first place, the quality of the surgical and radiologi-

cal service, the quality of the medical and scientific service there given. Really it is enough to make any of us feel proud to see what we have done and are doing there. I know something of medical service in hospitals.

I am not always in the mood to praise everything doctors do. I am sometimes at loggerheads with members of my profession, and I am therefore glad to speak of the extraordinarily fine work done from the professional point of view; but it is also from the human spirit of which Father O'Conor spoke earlier. The spirit of humanity and cheerfulness and explanation and courage that is given by the physicians and also by that extraordinary corps of nurses which after all makes such a tremendous difference to the welfare of the patient and also by that third group to which Dr. Greenough has referred—the social workers. For at a place like this we must not be content with giving only good medical service. We must let them know they are getting it. I have seen good medical clinics where good work was done, but people didn't go there because of the *way* the work was done. Now here in this hospital at Pondville they are equally good in conducting the service from the scientific point of view and skilful and humane in the way they have been doing things.

Now what is to make this campaign a success throughout the State as we believe it will be? It is to be not only the public support for this central hospital at Pondville but for the clinics throughout the State. If the clinics are left to what the doctors doing their level best can do, they will not be successful. Many times in a doctor's experience one has an occasion to see a clinic start and then be built up and be attended by a great many patients and be successful or stay so. What makes the clinic build up? It is the attention given by those in control to make sure that the things being done by nurses and social workers are what people like.

Now in each different clinic which Dr. Bigelow and his assistants have started throughout the State is a local committee, lay and medical, to see how this thing is done, and if we think that now the Governor and the Legislature and the Commissioner of Health and the committees over which Dr. Greenough presides can do it all, then if the people think they can sit back and see it go by, they will be disappointed. It has got to be the local spirit of the community to see that the people find out what can be done for them in their community and homes.

It is impossible to have Pondville a place where people go to die. It is impossible, in the first place, because the place would be unbearably sad. It must be a place where people are cured or spared in many cases. People when they come to the end of their lives want to be near their homes. So there must be provision for people who are to end their lives being near their homes. People go a long distance to Pondville for relief, but when it comes to the end of their lives, they need to be near their homes. So we need places near their homes, and then we need social service near their homes. These people have to be followed up after the clinic. They do not return to the clinic as often as they should; in other words, we ought to take that progressive attitude toward the disease as we took against tuberculosis. We ought to go after the patient instead of letting the patient come to us. You may not think that is necessary, but it is necessary in these cases, and that means that the social worker should follow these people up to see that they are getting the very best towards cure or towards relief.

Such institutions as we have started in this campaign have been inaugurated with an extraordinarily high standard, and, of course, can't be maintained cheaply. Of course, this thing has got to cost money—it can't be done in a niggardly way; and I want you to understand that the State has been liberal in this matter, because this being the first State in which this campaign starts, we owe it to the whole country and to some extent to the whole world not only to start it but to start it right, and it can't be started right if you go at it in a niggardly spirit. And we have gone about it right, spending money for first-class service, and when it comes to the attention of the tax payers, they must remember it is being done not only for Massachusetts but for the whole world, for whom, I believe, Massachusetts is going to set an example. (Applause.)

DR. GREENOUGH: The American Society for the Control of Cancer has sought to employ every agency available for the dissemination of knowledge and for the excitement of interest in the cancer problem. The moving picture has great possibilities in this direction, and we are going to show you a moving picture film produced by the American Society which deals with this subject as a close of the evening's meeting.

Moving picture entitled "A Fortunate Accident" was shown. This depicted the street accident of a woman given a thorough examination by the attending physician who thereby discovered an early and unknown cancer which was treated successfully.

The meeting was then adjourned.

VERMONT STATE MEDICAL SOCIETY

USE OF ULTRA-VIOLET RAYS IN TREATMENT, WITH SPECIAL REFERENCE TO CHILDREN*

BY EDWIN T. WYMAN, M.D.†

THE value of sunlight as a health giving agent has been realized by mankind from the very earliest time of which we have any record. The sun was worshipped in ancient civilization because of its supposed power of being able to drive away the demons of sickness and to expel disease. Herodotus, 431 B. C., mentions the sunbath and recommends it for restoring muscular tone. During the Roman era, the sun was made the central object of adoration. A solarium, situated, as a rule, on the roof of a house, was considered a part of almost every Roman home.

Heliotherapy, while thus well known as a therapeutic measure in olden time, became a lost art for many centuries, practically until the nineteenth century.

The centuries' old saying, that "Light is the life of man" is only now beginning to be realized in full significance. Sir Oliver Lodge aptly sums up the whole question of sunlight in the following words—"When the most efficient parts of sunlight are excluded, the organisms are apt to succumb to their ravages when unaided by the beneficial influences of sunlight". Sir Isaac Newton, by his discovery of the spectrum, opened up the path to the various fields of invisible radiant energy and to the production of artificial therapeutic rays. Even Newton only saw the spectrum of visible radiation and it was not until 1801 that Ritter, noticing that silver chloride was blackened by invisible rays situated beyond the visible violet rays, rightly concluded that radiant energy is present in the ether which is visible to the eye. These radiations, owing to their position in the spectrum, are called ultraviolet rays, and these are the rays which have proved to exert the greatest therapeutic influence.

When a narrow beam of sunlight enters a dispersing prism, that portion of the rays which is not reflected, is refracted at the surface as it enters the prism and is thus decomposed. Still further decomposition or dispersion occurs at the surface of emergence. A vari-colored image, called a spectrum, gradually changing from red at one end to violet at the other end, is produced. From the red end to the violet end the wavelengths of the radiation causing the different color sensations gradually become shorter. The shorter the wavelength, the greater the refraction. Beyond the visible red rays there are invisible heat rays which may be detected by their heating effect on the blackened bulb of a thermometer. At the other end of the spectrum, beyond the violet, there are invisible ultra-violet rays, the presence of which can be detected by chemical reactions or fluorescence. The ultraviolet light is made up of those rays of which the wavelength is from 390 to 60 millimicrons. The longer ultraviolet rays are termed the near ultraviolet and include those present in the solar spectrum, 390 to 290 millimicrons. The shorter ultraviolet wavelengths are designated far ultraviolet rays and comprise those shorter than 290 millimicrons. Beyond the ultraviolet rays lie the X-ray and gamma region. On the other end of the visible spectrum, beyond the red rays, we find the heat and infra-red rays, and, still farther, the long waves used in wireless. A consideration of the absorption spectrum of protoplasm reveals some very important facts concerning the penetration of these various rays into tissue. For example, in the heat region of the spectrum and especially the part of the heat region which lies nearest the visible spectrum, it will be observed that, if we move in the direction of the visible rays, the absorption index decreases and the penetration of the tissue by the rays increases. If, therefore, we wish to use radiant heat as a therapeutic agent, greater penetration will be obtained, if we use those radiations lying as close as possible to the visible part of the spectrum. If we could obtain a sufficient amount of energy, we would observe a greater penetration, if we were actually using the visible rays. The chief difficulty, in using visible light as a source of heat, is to obtain sufficient intensity of heat-penetrating rays without, at the same time, having an excess of long wavelengths or dark heat rays, which are absorbed at the surface, and, therefore, produce excessive surface burning. If one exposes the skin to the radiant heat from a hot stove, even though the intensity of the radiations exceeds the tolerance of the skin, the body, as a whole, is not appreciatively warmed, but an exposure of the skin to the radiant heat of the sun will warm the body to the bone without burning the skin. The reason for this is to be found in the fact that the heat rays from the stove are soft, easily absorbed rays, while the radiations from the sun contain hard, penetrating heat rays. The solar rays penetrate deeply into the body and warm the blood stream, while the radiations from the stove are absorbed too near the surface of the skin to warm the blood.

In the ultraviolet region of the spectrum, the

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†For record and address of author see "This Week's Issue," page 524.

conditions are just the reverse. As the wavelength decreases, the penetration increases. The soft ultraviolet rays have a longer wavelength than hard ultraviolet rays. The near or soft ultraviolet rays contained in the sun's spectrum are non-penetrating rays and are absorbed by the skin. They are easily filtered out by dust or water particles in the air before they reach the earth. They are also largely filtered out by ordinary window glass, but are readily transmitted by quartz. These ultraviolet rays of the sun's spectrum vary in intensity during the different seasons of the year, being highest during the summer months and are lowest during the winter months. It is believed that this seasonable variation is due to the absorption of the shorter wavelengths by the atmosphere. In any event, it is evident that, from a therapeutic point of view, the determining factor is the quality, not the quantity of these short or ultraviolet radiations. We know that the lack of these short rays will predispose a child to rickets and spasmophilia and possibly may make them more susceptible to many other diseases. While the cause of rickets is not known exactly, probably light or the lack of sunlight is a very important factor, while poor ventilation, overcrowding, diet, climate and previous diseases may also be factors. We find here the probable explanation why negroes with their dark pigment and the dark-skinned Italian are so prone to rickets when removed from their native land. In Africa, the negro goes about naked and attains the maximum advantages from the sun's rays. In sunny Italy, the Italian, likewise, spends most of his time out of doors and rickets there is rare. When these people, however, come to the temperate zone, as in this country, they are forced to wear clothes and are more closely housed. The pigment in their skin filters out many of the already diminished ultraviolet rays in the sunshine, they lose the protective action of the sun to a great extent and, consequently, are prone to rickets.

Here in New England, during the warm summer months, it is possible to use direct sunlight in treating infants and children. It is impracticable to expose an infant and often inadvisable to expose older children to the direct rays of the sun during the fall, winter and spring months, on account of the cold and consequent loss of body heat. This difficulty, however, may be overcome by the use of a quartz window or a glass which is transparent to ultra-violet rays in order that the baby may have its sun treatment in a warm room. Window panes made from fused quartz transmit ultraviolet light better than any other known substance. The cost of producing it, however, makes it prohibitive except for experimental purposes. There are several ultraviolet transmitting glasses on the market. According to the report of the Bureau of Standards in Washington, D. C., the ultraviolet transmission of the various glasses is as follows:—

Corex glass, which is manufactured by the Corning Glass Works of Corning, New York, exceeds all other glasses yet produced and rivals quartz in transparency in the spectral region of 260 to 300 millimicrons. For therapeutic purposes, in regard to transparency to ultraviolet rays, this may be considered the perfect glass in that all glasses reflect about 8% of the incident light, and, because, the maximum possible transmission is about 92% of the incoming ultraviolet solar rays, Corex transmits 91.4% to 91.8% of the total ultraviolet solar rays which are absorbed by window glass. Corex glass appears to undergo no appreciable change in transmission when exposed to solar radiation. On the other hand, exposure to a quartz mercury arc causes a very marked decrease in the transmission.

Vitaglass, an English product, transmits 50% to 60% of the total ultraviolet activating solar rays which are absorbed by ordinary window glass.

Helioglass (Vioray) transmits about the same as Vitaglass, 50% to 60%. Vitaglass after exposure in a hospital window for one year was found to have a transmission of 25% at a wave length of 302 millimicrons. Further exposure to the quartz mercury arc reduced the transmission but little showing that solarization was complete. Helioglass has not been on the market for a sufficient length of time to obtain a complete solarization, but, however, two samples of Helioglass and Vitaglass exposed simultaneously to the sun in October and December, were found to have decreased in transmission at about the same rate. The average transmission of Helioglass after complete degeneration by the quartz mercury arc is about 30% at a wave length of 302 millimicrons.

Cel-O-Glass, which consists of a film of cellulose acetate on a wire mesh, transmits about 30% of the total ultraviolet solar rays which are absorbed by window glass. A sample of Cel-O-Glass that was exposed to the sun for 400 hours during the months of April to October decreased but little in transparency at a wave length of 302 millimicrons. On the other hand, samples that transmitted 30% at a wave length of 302 millimicrons when new, transmitted only 5% to 10% at this wave length after being exposed on the side of a building continuously day and night for eight months, April to December, showing that this change in transparency may be owing to the varying conditions of weather. However, Cel-O-Glass is cheap and can be easily replaced. Windows of these glasses should be ideal for nursery windows, where the baby can have its daily sunbath, for hospital windows and a number of possible applications for the use of ultraviolet light in the sun's rays.

However, during the winter months in New England, it is questionable whether or not there are sufficient ultraviolet rays in the sun's spectrum to be of much therapeutic value, although, our experiments tend to make us believe that the sun's rays through a quartz window are of definite therapeutic value even during the winter months.

Dr. A. Rollier of Leysin, Switzerland, may be said to be the pioneer in the field of sunlight therapy. He was the first to lay down a well-defined scheme for carrying out heliotherapy. The essential point of his routine treatment is to gradually increase the exposure of small areas of the body to the sun's rays until the entire body is exposed. Thereafter, the patient receives a daily sun-bath of from three to five hours. It should be pointed out that, whereas Rollier attributes the beneficial effect of his treatment to the sun's rays, it actually consists of the sun's rays, fresh air and rest. Although he recommends this form of therapy in tuberculosis, undernutrition, chronic infections, rickets, etc., the best results have been obtained in surgical tuberculosis and in rickets.

It may interest you to know that it is not necessary to journey to Switzerland to secure this form of treatment as many children affected with bone and joint tuberculosis, who are living at the New England Peabody Home for Crippled Children, can testify.

In our locality, when direct sunlight is used, the infants are placed in a warm room with the sunlight coming through an open window, on a veranda or sunporch or in the shelter of a garden or yard. If given in the open, the infant should be protected from the wind by a cloth screen on three sides. A sheet draped on three sides of the crib will do, although it is better to have the shelter four or five feet high. On cool days the hands and feet should be kept warm by means of mittens and socks, and a hot water bottle or an electric pad can be used to maintain the body heat. It is important, always, to protect the baby from drafts. In starting the treatment, the infant should wear a diaper, band and shirt. The head and nape of the neck should be protected from the direct rays of the sun by a sunshade, cotton hat, or a sheet draped over the head of the crib. During July and August the bath should be given between 8 and 10 a. m., or between 2 and 4 p. m. In June and September, it should be given in the middle of the day. At the start, the bath may be given two or three times a day, and, as the length of exposure increases, the number of baths are gradually decreased to one or two a day, depending on the complexion of the patient and the intensity of the sunlight. The entire body is gradually exposed to the direct rays of the sun. First, the baby is exposed with his diaper and shirt on. Next, the diaper is removed, and, last of all, the shirt is removed. The scheme used takes eighteen days to gradually get the exposure of the entire body up to one hour to the front and one hour to the back. This same scheme is used with children. First the legs and thighs are exposed, then the abdomen from the ribs to the hips, and the chest last.

No hard and fast rule can be laid down. The plan should be varied according to the general condition of the patient, the tolerance of the sunlight, temperature and wind, height of the sun and clearness of the atmosphere. It is better for patients whose skin burns very readily to take shorter treatment, three or four times a day, in order to more gradually accustom the body to the sun. Many patients with dark skins can withstand twice the exposure given in the table we use. The whole object of the scheme is to get the patient well tanned without sunburn.

At present, during the winter months and on cloudy days in summer, we are using a substitute for sunlight in treating infants and children. The mercury vapor quartz lamp and the carbon arc lamp are the best means of artificially producing rays similar to the short therapeutic rays in the sun's spectrum. There are four American Mercury vapor quartz lamps on the market, the Alpine Sun Lamp, the McIntosh Lamp, the Burdick Lamp and the Victor Lamp. The Alpine Sun Lamp and the McIntosh Lamp are equipped with the Hanovia Burner, while the Burdick and Victor Lamps have the same burner—the Cooper-Hewitt uviarc. While ultraviolet rays from a carbon arc are not as intense as those from a mercury vapor quartz burner, the spectrum is more continuous and is more like the solar spectrum than the spectrum of the mercury vapor quartz lamp. All these lamps give off far ultraviolet radiations not present in the sun's spectrum, the exact physiological action of which is not definitely known at present. While these lamps serve as a substitute, I believe that direct sunlight, when it can be obtained, is the best means of giving general ultra-violet therapy. We are now using Alpine Sun Lamps in the Out-Patient Department and Medical Wards of the Children's Hospital, where individual treatments are given. In the Infants' Hospital we are using a room with four Burdick Lamps suspended near the ceiling, arranged to give as even a distribution of light as possible over the cribs. This permits us to treat a number of patients at the same time.

In regard to the use of ultraviolet rays in the treatment of disease in infants and children, it is very difficult to draw definite conclusions regarding the beneficial effects in all of the various conditions in which this form of therapy has been advised. During the past four years we have been studying the effects of this form of therapy at the Children's and Infants' Hospital in the treatment of a number of different diseases.

Rickets occurs universally in northern civil-

ized countries, such as Europe and North America, where there is lack of sunlight during the winter months. The seasonal variation in the occurrence of rickets offers striking evidence of the part sunlight plays in the prevention of the condition. Rickets flourishes generally under poor hygienic surroundings and especially under conditions where direct exposure of the rays of the sun is infrequent or entirely absent. Palm[1], in 1890, recognized the full importance of the lack of sunlight in the etiology of rickets and gave remarkable recommendations for the eradication of the disease by means of sunlight. Radzyinski[2] wrote, in 1912, "It is the sun that plays the principal role in the etiology of rickets". He gave the first proof of the favorable influence of light on metabolism by an experiment on puppies. In June, 1919, Huldschinsky[3] reported that the ultraviolet ray therapy exerted a curative action in human rickets. He treated four children who had advanced rickets, with the mercury vapor quartz lamp and found that at the end of four weeks, it was possible to demonstrate by X-ray the deposit of lime salts at the ends of the long bones of the extremities, and, at the end of two months, the healing was almost complete. This discovery of Huldschinsky of the curative action of light in human rickets has been corroborated by numerous other investigators. Hess and Weinstock[4] have made the remarkable discovery that such oils as cottonseed and linseed, which do not protect animals from rickets, and green vegetables, which have little or no antirachitic properties, can be endowed with anti-rachitic potency by exposing them to the radiation from a mercury vapor quartz lamp. The result of many studies has led to the conclusion that the chemical substances which can be activated by ultraviolet rays are cholesterol in animal foods and phytosterol in vegetable foods. These substances are present in almost every vegetable and animal cell. It is now generally recognized that rickets can be cured both clinically and, in experimental animals with certainty, by the administration of cod liver oil. It can also be cured with certainty by the action of ultraviolet light.

Spasmophilia is a nutritional disease characterized by convulsions, carpo-pedal spasms, laryngismus stridulus and an extreme irritability of the nervous system to mechanical and electrical stimulation. The blood shows a low serum calcium concentration. It has been made quite clear that all cases of spasmophilia have rickets, but, all patients with rickets do not have spasmophilia. To treat an established spasmophilia, one must use measures that will increase the blood calcium rapidly and permanently. Ultraviolet therapy has been shown to exert a favorable influence in spasmophili. These rays not only influence the symptoms favorably but the symptomatic relief is paralleled by a return of the calcium concentration in the blood serum to normal.

Gerstenberger and Wahl[5] and others found the ultraviolet ray of decided value in the treatment of peritoneal, glandular and occeous tuberculosis. Beneficial results were not obtained in pulmonary tuberculosis of the miliary type, although, treatments were begun early. The patients we have treated for tuberculosis of the mediastinal glands and tuberculosis of the mesenteric glands have responded well to ultraviolet therapy. The treatments have seemed to improve the patient's general condition, to relieve the symptoms, such as cough in the bronchial and abdominal pains in the mesenteric cases and to favor early calcification of the glands. Our results, in cases of tuberculous peritonitis, have been variable. It is not expected that ultraviolet therapy will cure all cases of tuberculous peritonitis. However, our cases show that it is a valuable therapeutic measure and we believe that it should be used unless there is marked febrile reaction.

We have observed marked improvement in all of the patients treated for psoriasis while they received treatment.

It is much more difficult, in treating tuberculosis and many other diseases with ultraviolet rays, to draw definite conclusions as to the benefits obtained from this form of therapy, because in rickets and spasmophilia, the X-ray and blood chemistry give confirmatory evidence of recovery. One has to depend almost entirely on clinical findings to note the progress of the case and it is often difficult to tell how much the disease has been influenced by the rest, fresh air, proper nourishment and general hygiene given as routine treatment in addition to the ultraviolet therapy.

It seems fairly certain that the average infant and young child in Boston does not get a sufficient amount of sunlight during the winter months and it is possible that in the future it may be shown that a certain amount of sunshine, either natural, through an ultraviolet transmitting glass or artificially produced ultraviolet rays, during the winter months will prove useful in maintaining a child's resistance against infections so common during the winter. Sunshine should not be looked upon as a quick and sure cure for all ailments. Sunshine, however, as well as other forms of radiant energy, are of unquestionable value in the prevention and cure of a number of diseases.

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THE USE AND ABUSE OF PHYSICAL THERAPEUTICS*

BY FRANK GRANGER, M.D.†

THE World War emphasized the rationale of physiotherapy. As a result the American Medical Association formed a Council on Physical Therapy. This Council is to be to physical measures of treatment what the Council on Pharmacology has been, and is, to drug therapeusis. It is composed of physicists, biophysicists, physiologists, internists, etc. Some of its activities are:

1. The preparation of basic papers on such subjects as the roentgen ray, radium, hydrotherapy, electro-therapy, massage, mechanotherapy, exercise, and muscle training. An exhaustive paper on the physiological effects of heat has already been published.
2. The standardization of apparatus.
3. The careful investigation of the advertising literature with the aim of curtailing extravagant claims, particularly in regard to treatment and cure of disease.
4. The laboratory and clinical investigation of the effects and results of the treatment of disease by means of physical measures.

In the past, the lack of adequate instruction in the medical schools—the avidity with which quacks and charlatans grasped these measures—the overenthusiasm of some physicians specializing in physiotherapy—the lack of careful laboratory check ups—and the ignorance in general of the medical profession, relegated this method of treatment to an obscure and ofttimes derided position.

The mysticism which shrouds electrotherapy is being rapidly dispelled.

We now know that one or more of the following properties are inherent in all forms of Electricity:

1. *Heat.* The tissues offer more or less resistance to the passage of electricity, hence heat is generated.
2. *Mechanical.* The faradic and sinusoidal currents cause muscular contraction; so does galvanism if interrupted. Similarly does the static sparks or static wave current.
3. *Chemical.* The only two electrical currents having distinct polarity and hence chemical effects are the galvanic and static, in each case the positive pole is a sedative and has an acid reaction, while the negative is an irritant and has an alkaline reaction.
4. *Psychological.* All forms of treatment, even at times surgery, possess this in varying degrees. With its impressive and awe-inspiring apparatus, physical therapy is capable of making the most profound mental impression on the patient.

In the past the charge has been made that these valuable adjuncts to standard treatment possessed only this last property.

Some of the laboratory observations were:

1. The influence of ultra violet on the chemistry of the blood, whereby the calcium and the phosphorus content of the blood were generally augmented.
2. The power of diathermy in suitable cases of nonunion or delayed union of bone in hastening the formation of callus.
3. The more rapid disappearance of calcium carbonate in bursitis with calcification by means of the same diathermy.
4. The increase in basal metabolism under auto-condensation.
5. The increase in urinary solids, hitherto deficient, by auto-condensation, and at times by the sinusoidal current.
6. The deposition of calcium salts in rickets.
7. The influence of actinic energy not only on the hemoglobin content of the blood but also on the number of red cells, and not infrequently on their differential count.
8. The increase in the alkali reserve under the administration of radiant heat.

The following cannot be reiterated too often: Physical therapeutics should be used only as one of the triad of medicine, surgery and physical therapeutics, and only in connection with its sister members. Generally the best results are secured from a prescription combining at least two of the five subdivisions of physical therapeutics—hydrotherapy, electrotherapy, passive exercise in the form of massage, active exercise in the form of gymnasium or games, muscle reëducation, and mechanotherapy (the last strictly speaking a combination of muscle reëducation and gymnasium with the possible added incentive of competition).

INDICATIONS FOR PHYSICAL THERAPEUTICS

Nonunion or Delayed Union of Bone. Here adequate fixation is essential. Given this, diathermy, or diathermy and ultra violet are indicated. Ordinarily, though, diathermy suffices in a fair percentage of cases. Whenever possible the lateral method should be used. If not, the double cuff method, though less efficient and requiring a longer time both for treatment and for recovery, will accomplish the same result but with a decreased percentage of success. If the parts are encased in a plaster cast, windows should be cut in its lateral or anteroposterior aspects. One window should be at the upper edge of the fracture, the other at the lower edge. Into these apertures, metal strips should

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†For record and address of author see "This Week's Issue," page 524.

be inserted. In this manner, an adequate heating through may be secured. I have never seen any swelling of the tissues from such a procedure. If after four weeks there still is no callus, a general treatment with air-cooled ultra violet should be added. Its value may be enhanced by the daily oral administration of from 10 to 15 grains (0.65 to 1 Gm.) of some calcium salt.

Bursitis. This condition, especially of the subdeltoid type with calcification, as a rule promptly yields to : (a) diathermy through the bursa and contiguous tissues, (b) chlorine ionization through these strictures, (c) massage for its local circulatory effect; (d) stretching, gentle at first and later, if there is not too much reaction, vigorous. While in many of these cases the patients get well spontaneously without any treatment, if physical measures are employed pain is lessened, the time of disability is shortened, and the percentage of recoveries is increased.

Neuritis. Focal infection should always be sought for and removed if found. The treatment should be individualized. In general, there should be a primary application of heat. This may be radiant heat, diathermy, infra-red, or the whirlpool bath. This should be followed, dependent on the type of neuritis and the degree of inflammation by galvanism or the static brush discharge. In cases of extreme nerve inflammation, heat and the static brush discharge may be the only thing that can be tolerated by the patient. Later, careful massage and motion should be used. The latter may be active assistive, active, or active resistive.

Pneumonia. Diathermic heat is of value in this disease as it diminishes pain, improves transiently the heart's action, and induces sleep. These factors alone make it a valuable adjunct to other standard or routine methods of treatment. I do not believe that diathermy ever shortened the course of this disease, but by relief of pain and increasing the amount of rest it may tide the patient over until lysis or, rarely, crisis occurs. The Brooklyn Naval Hospital employs diathermy as an adjunct in every case as soon as the diagnosis is made. The same holds true at the On-Shore Station of the Boston Floating Hospital. That diathermy does relieve the pain is attested by the fact that in hospitals where it has been used as a routine measure the bills for narcotics have been lessened by at least 50%. At least, diathermy should be considered as a possible adjunct to other treatment. The technic is simple, and I have never found any bad effects on the heart with this procedure. Six by nine electrodes should be placed anteriorly and posteriorly, the posterior one more to the left, the anterior one more to the right. From 1,000 to 1,800 milliamperes may be safely used. It is well to turn the current on gradually, taking three or four minutes to attain the maximum strength. The anterior electrode may be held on by a sandbag, hot water bottle, the hand of the operator, or adhesive plaster. The duration of the treatment should be at least thirty minutes. Treatments may be given as often as indicated, varying from every six hours to once a day.

Fractures. Despite certain published reports, physical therapeutics intelligently used is of the greatest benefit. The wage earner is little interested in being told "that his bone has knitted" if, because of lack of functional restoration, he is unable to work or can do so only with difficulty. Delayed union or nonunion has already been discussed. Heat (radiant), infrared or diathermy) is valuable to relieve pain, to promote a more active local circulation, and to secure a certain degree of muscular relaxation. This should be followed by careful manipulation. Passive exercise should be either tabued or used with extreme caution, as a heavy handed technician can easily cause displacement or refracture. Active assistive exercise, on the other hand, is of great value. As the condition improves, active resistive movements should be employed. If there is nerve injury. galvanism and some of the mechanical currents may be indicated.

Arthritis. In the consideration of this pathologic condition it is presupposed that the requisite careful physical and laboratory examinations have been made, and that, where foci of infection may be a causative factor they have been removed. Symptomatic cure is frequently attained by the use of diathermy and galvanism, and at times by the addition of autocondensation. Pain is generally relieved. If there is no mechanical obstruction, motion becomes free. Although this improvement may be permanent, in some cases the symptoms return from eight to sixteen months later; as a rule, however, the same relief as before can be attained.

Time does not permit the enumeration of other pathological conditions in which these measures of treatment have an accepted place. In this brief paper I have endeavored to show that there is a rational scientific basis for the use of physical therapeutics and that as an adjunct to other standard measures it is capable of shortening time of disability, securing functional restoration, and of enabling some, who otherwise would be helpless cripples, to return to their rightful position in the world.

MISCELLANY

AS OTHERS SEE US

What do they see? A perfect portrait? A work of art? A masterpiece? Maybe. And again maybe

not. Have you heard anyone say? If not, better enquire. Their view-point is good, they have the perspective. They see us as a whole and they examine us in detail. What they see ought to be a correct picture. Their verdict is emphatic and weighty. If unfavorable, what? Who is mistaken? Are they? Or, are we?

Too little attention is given to public opinion by all classes and groups. Teachers, clergymen, lawyers, physicians, retailers, wholesalers, producers, each and all must study public opinion if they wish to succeed in the fullest sense. Public judgment can and does point out weaknesses which are not seen by introspection.

Adverse criticism should be a signal for thinking. If there is no truth in it, it will quickly succumb. If truthful, it had better be faced at once and the fault corrected. Class and mass will succeed the better they understand each other and the more they attempt to meet the other's needs.

W. G. R.

STATE DEPARTMENT OF PUBLIC HEALTH

Report for March, 1928

The following communicable diseases have been reported during the month: chickenpox, 170; diphtheria, 3; German measles, 5; measles, 325; mumps, 448; scarlet fever, 60; streptococcic sore throat, 14; typhoid fever, 1; tuberculosis, 17; whooping cough, 141.

The following examinations were made by the Laboratory of Hygiene:

Examinations for diphtheria bacilli	85
" for Widal reaction of typhoid fever	25
" for malarial parasites	0
" for tubercle bacilli	238
" for evidence of syphilis	296
" for gonococci in pus	83
" of blood for contagious abortion in cattle	25
" of blood for white diarrhoea of fowls	1313
" of water, chemical and bacteriological	34
" of water, bacteriological	112
" of milk, market	19
" of milk submitted for chemical only	3
" of milk submitted for microscopical only	18
" of milk submitted by Department of Agriculture for added water	4
" of foods	25
" of drugs	0
" for the courts, autopsies	1
" for the courts, miscellaneous	28
Autopsies to complete death returns	1
Examinations of animal heads for evidence of rabies	1
Miscellaneous examinations	71

The Division of Venereal Diseases reports as follows:

Cases of gonorrhea	21
" of syphilis	43
" of gonorrhea reporting for treatment	5
" of syphilis reporting for treatment	7
" for intravenous treatment	5
Total treatments	85
Total gonorrhea outfits distributed	92
Wassermann outfits distributed	348

The Division of After-care for Poliomyelitis reports 54 patients seen, 16 new pieces of apparatus fitted, nine patients were admitted to hospitals and 12 patients were discharged from hospitals. Sales from articles made under direction of the vocational teacher amounted to $76.47.

In the Division of Maternity and Infancy, the nurse visited six towns.

BENNINGTON COUNTY MEDICAL SOCIETY

The Society meets regularly the third Wednesday of each month, the meetings are held jointly with the staff of the Putnam Memorial Hospital.

The Society has eighteen active members, the officers are: President, John H. Reichling, M.D.; Vice-President, E. M. Gardenier, M.D.; Secretary-Treasurer, John D. Lane, M.D.; Delegate, L. H. Ross, M.D.; Delegate, C. S. Buchanan, M.D.; Alternate, E. M. Gardenier, M.D.; Alternate, John D. Lane, M.D.

At the January meeting, the subject under discussion was, "Surgical Conditions of the Abdomen."

At the February meeting, Schuyler M. Martin, M.D., of Troy, N. Y., presented an able paper on the Electiocardiograph.

At this meeting the feasibility of a credit rating list was discussed, but no action was taken.

At the March meeting Wm. Kirk, M.D., of Troy, N. Y., presented a fine paper on Basal Metabolism.

The subject for the April meeting will be Effusions in the Pleural Cavity, and several cases will be presented.

Speakers expected to address the Society in the near future are Doctors McSweeney and Beecher of Burlington, and Rogers of Pittsford, Vt.

The Society which was somewhat somnambulant in the past has awakened, meets regularly and realizes that the price professional life and success is alertness, interest, and coöperation.

The question of a proper medical practice act for Vermont is ever a live one with this Society.

John D. Lane, M.D.,
Secretary.

NEWS ITEMS

COUNTY NEWS AND NOTES

The Burlington and Chittenden County Clinical Society has had four meetings this year. In November at the annual meeting, R. S. Maynard was elected President, E. W. Pike Vice-President and P. K. French Secretary-Treasurer. At this meeting Dr. B. D. Adams, the retiring President, spoke on the subject "Radium—Some of its properties and dosage," reporting thirty cases of cancer of the face and mouth.

At the December meeting, Dr. Ball of Rutland was the guest speaker, his subject being "The Interrelationship of X-Ray and Surgery."

The speaker at the January meeting was Dr. George Warren of New York City, who spoke on the "Diagnosis of indefinite pains of the kidney." This paper was especially interesting because of the many fine X-ray plates Dr. Warren brought with him to illustrate his talk.

In March the meeting was devoted to the subject of Gynecology, Dr. G. I. Forbes of Burlington and

Dr. H. A. Durfee of Burlington being the speakers. Dr. Forbes took as his subject the use of Electro-Therapy in Gynecology, while Dr. Durfee spoke on Leucorrhea.

Chittenden County Clinical Society has lost through death during the year past three members, Dr. George H. Branch of Grand Isle, Dr. W. W. Townsend and Dr. Barnet Frank of Burlington. These men, well known in their communities for faithful service and devotion to duty, will be very sincerely missed by the members and by the citizens of the towns where they lived.

We have elected five new members during the year and reinstated two more.

Vienna seems to be the goal of many Burlington physicians this year. Dr. H. A. Durfee returned this fall from two months of study there, and Dr. Seth Martin returns this month. Drs. A. R. Hogan and A. L. Larner are in Europe at present and Dr. Paul French leaves for Vienna next week. Dr. O. N. Eastman has spent the winter in California and at the Mayo Clinic in Rochester, Minn., and Dr. Sam Sparhawk has held an internship in obstetrics in the Los Angeles General Hospital during the past winter.

During the November flood, Dr. T. S. Brown and Dr. F. S. Kent and members of the staff of the Mary Fletcher Hospital and of the senior class in the Medical College distinguished themselves by prompt and efficient service in the flood-swept towns.

PAUL K. FRENCH, *Secretary.*
H. S. F.

Dr. and Mrs. E. M. Nichols of Barton are receiving congratulations over the birth of their son, Elwin Milton Nichols, Jr., born March 29th.

RECENT DEATHS

Dr. J. A. Bouche of Montpelier died March 14th in a Montreal hospital, where he had been treated for several months for a complication of diseases.

Dr. Boucher was thirty-seven years of age.

He located in Montpelier in 1916 and had a large general practice. He gave up practice at the time of the November flood, although he had been ill for some time previous.

He is survived by a wife and one son.

Dr. E. G. Sprague of Barre, Vermont, well known specialist in eye, ear, nose and throat, died March 16th, at his home, after an illness of about three months. Dr. Sprague was born in Chelsea, Vermont, February 3, 1865. His parents moved to Brookfield when he was about two years of age. He was educated in the public schools of Brookfield, a graduate of St. Johnsbury Academy, entering the University of Vermont, where he graduated in both the academic and medical departments.

He first located in Rumney, N. H., where he did general practice for several years. He then decided to specialize and spent several months in New York, later going abroad for further study, where he remained about a year. Returning to Vermont, he located in Barre, where he built up an enviable practice.

In 1903 he married Hettie Cook of Rumney, New Hampshire, who survives him, also three children, Mrs. Elizabeth Newton, J. Hebard Sprague, and Hettie Sprague, all of Barre.

Besides being a fine physician, Dr. Sprague was a cultured gentleman and a loyal friend.

ONLY ONE LEFT OUT

The health officer of Bridgewater reports that all school children in that town except one, and all pre-school children over the age of six months, have been treated with toxin-antitoxin to prevent diphtheria. The use of toxin-antitoxin is not compulsory and the treatment is not given without the consent of parents.

The mother of the one child not treated is of foreign birth. In her native country she might not have as much freedom of choice in regard to protecting her children against disease as is accorded her in this country. While it is true that her child will be afforded a degree of protection because the neghboring children are protected against the disease, it is also true that she is still incurring an unnecessary hazard.

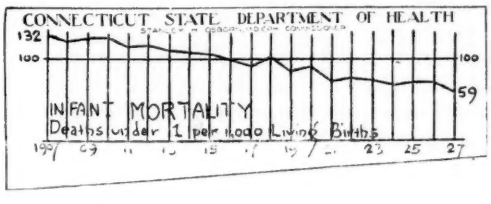
Altogether 88 of the 89 children in Bridgewater over the age of six months have received toxin-antitoxin. This means that a fraction less than 99 per cent. (98.87 per cent. to be exact) of the children were so treated. Can any other town in Connecticut, or elsewhere for that matter, show practically 99 per cent. of their children treated with toxin-antitoxin to protect them against diphtheria? If so, the State Department of Health would like to have information about such town. So far as is now known, Bridgewater holds first place in diphtheria immunization of its children. Will any other town challenge this position?

If an honor roll should be provided for all towns showing 95 per cent. or more of their school children treated with toxin-antitoxin to prevent diphtheria, how many towns could have their names placed on such roll? It is not expected that many towns will reach the high mark set by Bridgewater, but it is hoped that a number of them may show upwards of 95 per cent. of their children protected. The names of towns doing such excellent pieces of work should be known to the citizens of other towns as an encouragement to them to do likewise. What town will be the next to let its light shine?—*Bulletin of the Connecticut Department of Health.*

INFANT MORTALITY IN CONNECTICUT

Fifty-nine deaths under one year per one thousand living births is the lowest rate ever recorded in Connecticut.

Infant death rates since 1907 are shown in the chart below.



Case Records
of the
Massachusetts General Hospital

ANTE-MORTEM AND POST-MORTEM RECORDS AS USED IN WEEKLY CLINICO-PATHOLOGICAL EXERCISES

EDITED BY R. C. CABOT, M.D.

F. M. PAINTER, A.B., ASSISTANT EDITOR

CASE 14101

EPIGASTRIC PAIN, VOMITING AND DELIRIUM

SURGICAL DEPARTMENT

An unmarried American stenographer twenty-five years old entered the hospital January 5 complaining of abdominal pain.

For forty-eight hours before admission she had had moderately severe episgastic pain. At the onset she vomited about a cupful of reddish brown blood. The following day and the morning of admission she vomited clear fluid. During the illness she had had fever, anorexia and marked weakness.

Her family history is good.

Thirteen years before admission she had thyroidectomy. Two years before admission she had appendicostomy for colitis. She had had periodic sensations of discomfort in the epigastrium, usually of a day's duration, which occurred coincidentally with menstrual cycles and followed complete cessation of menstruation in April, twenty months before admission. Since the onset of this her stools had had the gross characteristics of mucous colitis. Her catamenia had always been irregular. During the winter before admission she was despondent and attempted suicide with veronal. During the past few months her health had been good as compared with the past few years. She had gained weight.

Clinical examination showed a fairly well developed and nourished woman with pale skin and mucous membranes. An old scar on the anterior surface of the neck, well healed. Heart not enlarged. A soft blowing systolic murmur over the apex, not transmitted. Pulses not of good volume and tension. Blood pressure 130/70. Lungs normal. Abdomen somewhat distended, tympanitic throughout, tender over the right upper quadrant and epigastrium, especially the former, on deep palpation. An old scar over the appendix with a small fistula. Slight purulent discharge. Vaginal examination unsatisfactory. Moderate tenderness in both fornices. Extremities, pupils and reflexes normal.

Urine at admission negative. The day of death the very slightest possible trace of albumin, acetone positive, 6 to 10 leukocytes and 2 to 5 red cells per field (not a catheterized specimen), many granular casts. Blood: 21,000 to 16,600 leukocytes, 82 per cent. polynuclears, 20 per cent. lymphocytes, hemoglobin 50 per cent., reds 3,560,000. Wasserman negative. Stool examination showed gross blood and bile.

X-ray. The detail of the lung was obscured by respiratory motion. The right lung was slightly less radiant than the left, especially at the base.

Temperature 102° to 106.2°, rectal. Pulse 112 to 167. Respirations 24 to 37.

The patient was critically ill, semidelirious. She went rapidly downhill. The medical and surgical House staff and a medical consultant could make no diagnosis. January 7 she became comatose. A lumbar puncture showed normal dynamics. The spinal fluid showed 350 leukocytes, normal chemical contents. That day the patient died.

DISCUSSION

BY RICHARD C. CABOT, M.D.

NOTES ON THE HISTORY

It is rare to have thyroidectomy at twelve, but we have to take the statement as given.

The remark about appendicostomy and colitis is surprising. In the first place one does not expect to see a person who has colitis so severe that appendicostomy is done recover as this person seems to have recovered. In the second place it is spoken of later as mucous colitis. This makes me suspect that is what it was in the beginning. If so, appendicostomy was the worst thing they could have done.

NOTES ON THE PHYSICAL EXAMINATION

There ought to be more detail on the spinal fluid. We do not often get normal chemical contents with 350 leukocytes. I should think that fact of the leukocytes the most important fact that we have.

DIFFERENTIAL DIAGNOSIS

The complaint with which she came, abdominal pain and vomiting of reddish brown fluid supposed to be blood, does not easily associate itself with the final symptoms, especially with the lumbar puncture fluid. Knowing that she had had an appendicostomy we wonder if that and the adhesions might possibly have some connection with the abdominal symptoms; but I do not think the evidence is good. An appendicostomy ought to leave very little in the way of adhesions. In the second place her symptoms do not seem to be particularly in that region. There is nothing said about abdominal spasm. The abdomen is distended, tympanitic and tender. She has nervous symptoms, semidelirium and coma. I should say the best ex-

planation is general infection in which the nervous system took part and which showed itself with digestive symptoms in the beginning, rather than to say that local abdominal disease was the main cause of her death. Of course it is perfectly possible that she had a general peritonitis and that the meningeal irritation or meningitis is secondary to that.

The count of red cells looks as if this illness had been going on more than forty-eight hours, for it does not seem probable that she had vomited enough blood to cause that anemia, and there is nothing else to explain it. But what illness she may have had for more than forty-eight hours I have no idea. We have no evidence, I should say, of any chronic nephritis, although we do not know the gravity of the urine.

DR. RICHARD B. KING: It was perfectly normal.

DR. W. PEARCE COUES: Do you think she could have taken some poison a few days before admission to the hospital in a suicidal attempt?

DR. CABOT: That would have caused her vomiting, but I do not see how we can easily link that up with the condition of the lumbar fluid or with the anemia. I do not know any poison that will cause such an anemia in two days. There is not any evidence of jaundice or anything like acute liver trouble. I do not see how we can say she has tuberculosis in any form or syphilis in any form.

A PHYSICIAN: Can it be endocarditis?

DR. CABOT: The history must be very defective if that is true.

A PHYSICIAN: She has a systolic murmur.

DR. CABOT: Apparently she was sick only forty-eight hours. If she had had endocarditis I should have been satisfied to explain the abdominal symptoms in that way; but I should say that we have no good basis for a diagnosis of endocarditis in any form.

A PHYSICIAN: How do you explain the bloody vomitus and bloody stool?

DR. CABOT: We see a great many critically ill patients, especially on the surgical side, vomit reddish brown fluid. This happens in peritonitis often, but also in a great many cases in which we never find a cause. The stool examination showed gross blood, but we do not know as to the question of hemorrhoids. We have no rectal examination. She is said to have had a colitis, not however of the type that ordinarily shows gross blood. Possibly her anemia is due to old colitis. If she has lived here that colitis was probably not of the type likely to spread beyond the intestine. I do not believe that I can make a diagnosis.

DR. KING: She had a perfectly normal blood sugar and her CO_2 tension was about 40 volumes per cent. I saw her about twelve hours after she became comatose and thought she might be in diabetic coma because of the tremendous hyperpnea which she was said to have had for some hours.

DR. CABOT: You do not know any more about that leukocyte count in the spinal fluid, do you?

DR. KING: No, sir.

DR. CABOT: That is the most definite fact we have. If only we had a little bit more!

DR. TRACY B. MALLORY: There must have been a high percentage of polymorphonuclears.

DR. CABOT: What makes you think that?

DR. MALLORY: From our examination of the spinal fluid post mortem.

DR. CABOT: Let us say then that they are polymorphonuclears. That means acute meningitis. Is that all there is? No, because acute meningitis does not cause anemia, and she has it. I think we must say some form of acute meningitis. Beyond that my only guess is that there is also some form of sepsis, local or general.

CLINICAL DIAGNOSIS (FROM HOSPITAL RECORD)

Acute miliary tuberculosis.
Tuberculous peritonitis.

DR. RICHARD C. CABOT'S DIAGNOSIS

Acute meningitis.
Sepsis, local or general.

ANATOMIC DIAGNOSES

1. *Primary fatal lesions.*

Septicemia, staphylococcus aureus.
Staphylococcus meningitis.
Miliary abscesses in heart, spleen and kidney.

2. *Secondary or terminal lesions.*

Chronic colitis.
Focal necrosis of the adrenals.

DR. MALLORY: The primary diagnosis was septicemia with staphylococcus aureus. It showed up in the blood culture. Numerous miliary abscesses were found in the spleen, heart and kidneys. The lungs contained an old infaret which must have been due to a much older processs than this. No source or suggestion as to where it might have come from was found. The brain showed a definite purulent meningitis also due to the staphylococcus aureus. She did have a true chronic colitis without any gross ulcers but with very marked thickening of the wall of the sigmoid colon and a typical cellular infiltration which extended down through the mucosa and muscularis into the serosa. No source for the sepsis was found. Whether it was possibly an extension from the colitis, I cannot say. It hardly seems likely.

DR. CABOT: Is the organism of this form of colitis known, in your opinion?

DR. MALLORY: Not certainly. From a very considerable proportion of them we can recover streptococci, usually of the viridans type. A special diplococcus has been found in many cases

by Bargen of the Mayo clinic and he has also had very favorable results from specific vaccine therapy. I do not feel, however, that the etiology can be considered settled.

DR. CABOT: Do you take it the colitis is the cause of the anemia?

DR. MALLORY: The sepsis may have persisted very much longer than the history suggests. The kidney showed not only acute miliary abscesses situated around infectious thrombi in small blood vessels, but all stages of healing abscesss and all stages of septic infarcts. So that I think the process must have lasted several weeks without much question.

CASE 14102

LOWER ABDOMINAL PAIN; QUESTION OF TREATMENT

SURGICAL DEPARTMENT

An American insurance agent twenty-three years old entered the wards from the Emergency Ward December 23 for study of pain in the lower abdomen.

A year before admission he had two attacks similar to the present one and six months before admission a third. These attacks were accompanied by nausea and vomiting. None of them lasted more than a day. The night of December 21 he was awakened at midnight with severe epigastric pain radiating downward to the lower abdomen, more to the right. He was nauseated and induced vomiting. The pain kept him awake the rest of the night. The morning of December 22 his physician gave him morphia. He slept most of the day. In the evening the pain was sharper and more localized in the right lower quadrant. His temperature was elevated. He came to the Emergency Ward that evening.

His family and past histories are unimportant. He had always been quite healthy.

Clinical examination was negative except for slight injection of the anterior pillars of the throat and tenderness in the lower abdomen, more marked on the right side. Peristalsis was audible. There was slight spasm of the right rectus muscle. Over McBurney's area there was some hyperesthesia.

Before operation urine normal, leukocytes 15,600, temperature 103.2°, pulse 92, respirations normal.

Operation was done the day after admission to the Emergency Ward. The patient made a good recovery from ether. Two days later the pulse suddenly rose to 140. The patient was a little irrational and vomited twice. Gastric lavage yielded 57 ounces. The temperature and pulse rose steadily to 105° and 142 respectively. The general condition was very poor. Rectal examination was negative. The abdomen was tender, but there was no definite localization of pus. December 30 500 cubic centimeters of blood was transfused. A blood culture was negative. The condition grew gradually worse. January 1 the patient was comatose. The sclerae were icteric. The abdomen was very rigid. There was surprisingly little drainage from the wound. That day he died.

DISCUSSION

BY EDWARD L. YOUNG, JR., M.D.

This seems like a perfectly good story in a young adult: similar previous attacks of pain with nausea and vomiting, and the present attack of epigastric pain shifting to the right lower quadrant: I have never but once in an acute surgical abdomen seen an attack of pain which started in the epigastrium and shifted to the right lower quadrant which was anything but an acute appendix. The one exception was when an acute gall-bladder presented in the wound. The explanation was that the acute gall-bladder started the same reflex that the acute appendix generally does.

I think the use of morphia in a case like this is to be commented on in order to be condemned. It is not the thing to do in a situation like this, because it may not only mask symptoms so that an erroneous diagnosis may be made by the surgeon, but it may make the patient sleep comfortably through the day, as this patient apparently did, while the process itself goes on. If he had not had the morphia he would not perhaps have allowed himself to go as far as this without calling for help.

Here is a record which ought to arouse suspicion at once. A temperature of 103.2° is never due to an uncomplicated appendicitis. There are exceptions to all rules, but that is an exceedingly good rule to go on, because it either means a ruptured appendix or a sepsis spread elsewhere than in the appendix. Add to that a leukocytosis which is not as high as we should expect with a severe septic process, and it makes us wonder whether the diagnosis is wrong or whether it is a good deal worse than examination suggests.

Is there any other diagnosis to consider? Of course occasionally we meet an acute appendix which is only one manifestation of a general septicemia. There is nothing to make one think of a general sepsis here. Although it speaks of slight redness of the throat there is no other suggestion that he has had a chance for sepsis to originate in that region.

Could it be pneumonia? There is no question that in certain cases it is of the very greatest difficulty to distinguish between an acute abdomen and a central pneumonia with reflex pain in the abdomen. On the other hand I have never known in pneumonia such a clean-cut story of epigastric pain shifting to the right lower quadrant as this man had. But the record says there

is only slight spasm of the right rectus muscle, and if there is a good deal of sickness one would expect a good deal of spasm. It has been going only about twelve hours, so that it is possible that it is pneumonia.

I do not see any other thing to consider. Perforated duodenal ulcer with the fluid trickling down to the right lower quadrant and giving pain with tenderness over the right lower quadrant is possible, but an acute perforation means a tremendous lot of spasm. It is the best example of a board-like abdomen that we have, practically always, and this does not present that picture.

It seems to me the only thing to do is to operate for an acute appendix, with a very anxious feeling in the back of our heads as we do it.

DR. CABOT: Would you make the usual incision, in the usual place?

DR. YOUNG: I should. I should start with local anesthesia, to be changed to general if necessary when the diagnosis is confirmed.

DR. G. S. SPEARE: He was operated upon the day after admission to the Emergency Ward, eighteen hours later. His temperature was high, and because of that we were doubtful whether it was appendicitis. It was 104° at entrance to the Emergency Ward. We sent him to the ward and operated the next day. The only sign indicating appendicitis was very slight tenderness in the right lower quadrant on deep pressure. There was no spasm. Rectal examination was negative.

DR. YOUNG: Did the local signs change? Did you get more spasm?

DR. SPEARE: They did not change very much. There was little spasm the next day.

DR. YOUNG: And you did not find anything in the chest to justify X-ray?

DR. SPEARE: No.

DR. YOUNG: Because of course occasionally the X-ray is the only thing that will tell us in a central pneumonia. I have seen two or three cases where it was the only thing that would tell us whether it was a pneumonic or an abdominal process. I think I should operate with the feeling that it was an overwhelming infection, with an acute appendix as part of the process.

A SURGEON: Doesn't the normal respiration rate argue against pneumonia?

DR. YOUNG: Yes. On the other hand it was about five years ago we had five cases that I saw myself where it was almost impossible to tell, and in two cases the X-ray was the only thing that did tell the difference. And one was four days after the onset of symptoms, and in that case the argument was that it would be impossible to have a pneumonia go four days without showing some signs. Yet it was there.

DR. YOUNG'S PRE-OPERATIVE DIAGNOSIS

Septicemia.
Acute appendicitis.

PRE-OPERATIVE DIAGNOSIS

Acute appendicitis.

OPERATION

Gas-ether. Right rectus muscle retracting incision. The peritoneum was opened. The appendix was found pointing toward the pelvis with a kink under the ileocecal valve. It was dissected off its bed with the finger. The distal two-thirds was entirely gangrenous. The proximal third was not inflamed at all. There was no free fluid in the peritoneal cavity. The base of the appendix was ligated, the mesentery cut, clamped and tied and the appendix removed with carbolic knife and alcohol. The stump was buried with a purse string suture. A cigarette wick was put in the pelvis with an angulation at the place where the appendix lay. The wound was closed.

PATHOLOGICAL REPORT

An appendix 7 centimeters long. The wall is black and covered with a vascular membrane.

Microscopic examination shows extensive hemorrhagic and polynuclear leukocytic infiltration of the entire wall with necrosis of the muscular layer and mucosa.

Gangrenous appendicitis.

FURTHER DISCUSSION

This is the type that we see with an overwhelming infection,—a gangrenous process without free fluid in the abdomen—and if we cut open the appendix nothing but the gangrene,—the appendix not filled with pus.

Of course transfusion of blood is in itself not a cure for sepsis, but where sepsis has brought down the blood the addition of new blood may add just enough to the patient's fighting strength to let him pull through. I assume that is the basis on which it was done.

The icteric sclerae again suggest the spreading infection with liver involvement.

I think Dr. Mallory will tell us that there is a spreading peritonitis in the abdomen without much walling off, and I am inclined to think he will tell us there is a positive blood culture. I do not think there has been time for the multiple abscesses of the liver to develop.

DR. CABOT: What proportion of the appendix cases you have seen have had sore throat or other respiratory infections?

DR. YOUNG: I do not think I can put it in figures, but there is no question that there is a definite percentage who have had a sore throat or respiratory infection within a recent time. I think the appendicitis often is a metastatic infection, and I think it occasionally is just one

part of a general infection, and those are the cases where we are apt to get a fatal termination even though the appendix itself and the condition of the abdomen at the time of operation are not such that we expect it to be fatal.

CLINICAL DIAGNOSIS (FROM HOSPITAL RECORD)

Acute appendicitis with peritonitis.
Septicemia.
Abscess of liver.

DR. EDWARD L. YOUNG'S DIAGNOSIS

Septicemia.
Gangrenous appendicitis.
Spreading peritonitis.

ANATOMIC DIAGNOSES

1. *Primary fatal lesion.*

(Gangrenous appendicitis.)

2. *Secondary or terminal lesions.*

General peritonitis.

3. *Historical landmark.*

Operation wound, appendectomy.

DR. TRACY B. MALLORY: The findings were exactly as Dr. Young predicted,—a generalized peritonitis. There was a positive blood culture —streptococcus hemolyticus—and no evidence of any liver abscess. I think his jaundice must have been hemolytic in character.

DR. CABOT: What brings about gangrene without pus in a case like this?

DR. MALLORY: I think there is usually pus microscopically. There may not be any gross amount.

DR. YOUNG: That is what I mean. There is no gross pus in many of these cases. There is no abscess around it, there is no distention. I saw a case last month. Two days before death the scrotum was gangrenous and there were large gangrenous areas on both thighs. He had a streptococcus infection starting in the throat.

DR. CABOT: Does that mean plugging of vessels by emboli?

DR. MALLORY: Only in part if at all. I think there is probably a direct action of bacterial toxins, and the extreme swelling and distention undoubtedly interfere with the circulation.

DR. CABOT: I think in relation to these cases we have come far enough away from the old times to be reminded of them. I happen to have been brought up in Brookline, where lived Dr. G. K. Sabine, who had about the best record for appendicitis cases of any man going. He never operated and he never lost a case. He took care of both of my brothers, one of whom I think now had a big abscess. His treatment was morphia, starvation, and everything that could be done to keep the mind as well as the body at rest. We say rightly, I suppose, today, that it is criminal to give morphia and lock up things. He did just that thing, and I have known very few people who had as good a record as his.

DR. YOUNG: When they died what did he say they died of?

DR. CABOT: His people didn't die.

DR. YOUNG: I think it is a question whether a patient in a case such as this would have died of a general septicemia or of peritonitis. I think he would have died, but I am not sure that it would not have been a generalized septicemia rather than a peritonitis.

PRIZE-WINNING PLAYS

The three prize-winning plays in the 1928 Massachusetts Health Playwriting Contest are "The Starter" written by the Class of 1928 of the West Springfield High School, "Soldiers of Peace" by Rita and Lester Radovsky of the B. M. C. Durfee High, Fall River, and "Lost and Found" by the Sophomore B Class of the Girls' Catholic High School, Malden. Honorable mention is made of "Flood" written by the Drama Class of the Technical High School, Springfield and "The Making of Mickey" by Barbara Clark of the Melrose High School. These three plays have been selected of the sixteen submitted by pupils of high schools in the State, for their health message and dramatic value. The prize-winning schools have been invited to bring their casts into Boston to present their plays at the Copley Theatre on Friday afternoon, April 27, at three o'clock. Following the presentation, speeches will be made by the judges and the awards of the prizes made to the schools.

This is the fourth year of the Health Playwriting Contest conducted under the auspices of the Massachusetts Tuberculosis League. Mr. E. E. Clive, director of the Copley Theatre, Dr. Francis P. Denny, a health officer in Brookline, and Mr. Robert B. Kelso, secretary of the Boston Council of Social Agencies, compose the committee of judges. After the production the prize-winning plays will be forwarded to New York to be reviewed by a national board of judges in the National Health Playwriting Contest conducted by the National Tuberculosis Association. The prizes for the nation-wide winners will be awarded at the convention of that association to be held at Portland, Oregon on June 18.

COORDINATION IN CANCER RESEARCH

An important conference was called by Surgeon General Cumming on April 9, with the object of obtaining coöperation and furthering the research into cancer by both Federal and private organizations. Three representatives of the Public Health Service attended and in addition eleven individuals representing private field of cancer research. A subcommittee of five was appointed to outline a definite program for cancer research and submit a report within two weeks. This committee consists of Dr. Francis Carter Wood, Columbia University; Dr. James B. Murphy, Rockefeller Institute; Dr. Warren Lewis, Carnegie Institute; Dr. W. H. Howell, Director of Hygiene, Johns Hopkins University, and Dr. Joseph W. Schereschewsky of the Public Health Service.

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A CHALLENGE TO THE DOCTORS OF MASSACHUSETTS

THIS week is devoted to a cancer campaign, the principal objective of which is to bring patients with cancer under competent medical supervision earlier to the end that more of the 5500 persons dying annually from this disease may be saved. It is conservatively estimated that 30 per cent., or about 1200, could be so saved if in each instance our present knowledge were adequately applied sufficiently early. The organized medical profession, the organized public and organized government are making an Herculean effort to arouse the adult public to their responsibility in this regard. Galvanized by the legislative program, a State cancer hospital has been opened and, what is much more significant, *under the direction of the local medical profession* cancer clinics have been opened in twelve cities outside of Boston. Probably never before in the history of the world have such readily accessible resources of such an average high quality been available against cancer. But the indications are that for every person seeking advice from a clinic, three to five go to a doctor privately. The campaign slogan is "Go to your doctor or a cancer clinic." Is this advice sound?

Because of the catholicity of cancer, to tell a person of advancing years that he has no cancer is probably one of the most taxing diagnostic problems of all medicine. When you consider that on the average each physician in the State sees two cancer cases a year, general expertness in recognizing this disease is impossible. But it is fair to expect the average thoughtful physician to reassure the 75 per cent. of persons which the clinics show are seeking advice without having the disease, and to make sure that those in whom there is doubt go promptly to where an authoritative opinion can be given.

Again it has been said that any cancer program is doomed because of the discouragement of the public. But in some instances the public discouragement is less profound than that of the profession. These doctors are frequently thinking in terms of results obtained ten or more years ago. They must bestir themselves and become informed as to what modern surgery, X-ray, and radium are accomplishing in certain types of cancer.

Lastly there is the group, unfortunately found in every large profession, who are not alive to their great opportunity and obligations. These are not found at the medical meetings and clinics arranged all over the State this week. These contribute to that too frequent scandal of diagnosing rectal cancer as hemorrhoids without an examination. These are loud in their criticism of all orderly efforts of the health authorities. These give substance to any popular contempt for our profession. To fully meet the challenge of the cancer campaign we must either reform or remove these from our midst.

This challenge of adequate service to those who seek us early is the most sobering and most stimulating that has ever been thrown down to any profession.

THE RELATIONS OF THE MEDICAL SOCIETY TO HOSPITALS

FOR several years there was a section of Hospital Administration which held its sessions at the Annual Meeting of the Massachusetts Medical Society. Recently, however, without any formal action this Section has ceased to function. Possibly there was no adequate need of a special section to consider problems of hospital administration. It was, however, a section which united the Society with those outside the profession. It is now proposed to do away with another tie between the Society and the public in the abolition of the Committee on Public Instruction. The JOURNAL does not undertake to point out the best method or methods of bringing

about co-operation between physicians and the public and of laying before the public the advances and the present state of modern scientific medicine. It is plain, however, that by some means or other this is essential if the Society is to fulfill its obligations. The opportunities open to the Staffs of hospitals to co-operate with their Trustees in giving the public a more accurate understanding of medical knowledge, of our problems and our triumphs and failures have been discussed recently in the issues of the JOURNAL. May it not be wise for the officers of the Society to consider whether a revival of the Section of Hospital Administration is a satisfactory manner of stimulating interest along the lines suggested. Certainly some method of bringing to others the useful experiences of any hospital is most desirable.

THE HEADQUARTERS FOR THE MASSACHUSETTS MEDICAL SOCIETY

WHEN the Berkshire District invited the Massachusetts Medical Society to hold its Annual Meeting in Pittsfield it started a movement which has already gone far toward welding together the physicians of the State and which promises to bring into closer community of interest the entire medical profession of New England.

It is plain that the interests of no Section differ in any way from the interests of every other. The strength or weakness of any District Society affect the State Society. The interests of all the Districts are common. The strength and activities of each have grown along with those of the parent Society.

The need of adequate headquarters has become imperative if the Society and its constituent Districts are to do their full duty to the Fellows and to the Commonwealth. The inspiration to secure such headquarters has come from the Springfield President of the Society.

Following out the suggestions made at a recent meeting of the officers of the eastern Districts a circular explaining the purpose of the Committee on Headquarters is being sent to each Fellow. Each District President and Secretary will form the nucleus of a subcommittee which will be large enough to permit every Fellow of the District to be interviewed by a member of the Committee. In one District one committee man has been appointed for every five Fellows. Thus no undue burden is placed on any member of the Committee. The response already made is most enthusiastic. Every Fellow will have the opportunity to give what he feels able to contribute no matter how large or small this sum may be.

The State-wide recognition of the need of adequate headquarters in Boston is shown by the fact that before formal requests for contributions have been made several thousand dollars have been offered from Springfield and Fall River.

Once again the Berkshire District has taken the lead. The first actual contribution paid into the hands of the Treasurer is one of five hundred dollars given as a memorial to the late Dr. Frank K. Paddock a former President of the Massachusetts Medical Society.

THIS WEEK'S ISSUE

CONTAINS articles by the following named authors:

GREENOUGH, ROBERT B. A.B., M.D. Harvard Medical School 1896. F.A.C.S. Visiting Surgeon Massachusetts General Hospital; Assistant Professor of Surgery, Harvard Medical School; Director, Cancer Commission of Harvard University; Surgeon-In-Charge, Collis P. Huntington Memorial Hospital. His subject is: "Cancer". Page 477. Address: 8 Marlborough Street, Boston.

LOMBARD, HERBERT L. A.B., M.P.H., M.D. Bowdoin, 1915. Epidemiologist and Chief of the Cancer Section, Massachusetts Department of Public Health. Address: 546 State House, Boston. Associated with him is:

DOERING, CARL R. A.B., C.P.H., D.Sc., M.D. Baylor University College of Medicine, 1921. Instructor in Vital Statistics, Harvard School of Public Health. Address: 55 Van Dyke Street, Boston. Their subject is: "Cancer Studies in Massachusetts. 2. Habits, Characteristics and Environment of Individuals With and Without Cancer". Page 481.

JONES, DANIEL FISKE. A.B., M.D. Harvard Medical School, 1896. F.A.C.S. Surgeon in Chief East Surgical Service, Massachusetts General Hospital; Surgeon, N. E. Deaconess Hospital, Surgeon-In-Chief, Palmer Memorial Hospital; Associate in Surgery, Harvard Medical School. His subject is: "The Early Diagnosis of Carcinoma of the Rectum". Page 487. Address: 195 Beacon Street, Boston.

CHEEVER, DAVID. A.B., M.D. Harvard Medical School, 1901. F.A.C.S. Associate Professor of Surgery, Harvard Medical School; Surgeon to the Peter Bent Brigham Hospital, Boston. His subject is: "Carcinoma of the Gastro-Intestinal Tract". Page 488. Address: Peter Bent Brigham Hospital, Boston.

SMITH, GEORGE GILBERT. A.B., M.D. Harvard Medical School, 1908. F.A.C.S. Urologist, Massachusetts General Hospital and Palmer Memorial Hospital; Surgeon, Huntington Memorial Hospital. His subject is: "Malignant Diseases of the Genito-urinary Tract". Page 496. Address: 6 Commonwealth Avenue, Boston.

DALAND, ERNEST M. A.B., M.D. Harvard Medical School, 1918. F.A.C.S. Chief of Staff,

Pondville Hospital, Norfolk; Surgeon, Collis P. Huntington Memorial Hospital; Surgeon to Out-Patients, Massachusetts General Hospital. His subject is: "Cancer Case Histories". Page 499. Address: 483 Beacon Street, Boston.

WYMAN, EDWIN T. M.D. Tufts College Medical School, 1911. Instructor in Pediatrics, Harvard Medical School; Assistant Physician Children's and Infants' Hospitals, Boston. His subject is: "Use of Ultra Violet Rays in Treatment With Special Reference to Children". Page 510. Address: 483 Beacon Street, Boston.

GRANGER, FRANK B. A.B., M.D. Harvard Medical School, 1902. Instructor of Physical Therapeutics, Harvard Graduate School of Medicine; Physician-in-Chief, Department Physical Therapeutics, Boston City Hospital; Lecturer in Physical Therapeutics, Tufts Medical School. His subject is: "The Use and Abuse of Physical Therapeutics". Page 514. Address: 520 Commonwealth Avenue, Boston.

The Massachusetts Medical Society

SECTION OF OBSTETRICS AND GYNECOLOGY

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Frederick J. Lynch, M.D., *Clerk*

Use of Pituitrin During Pregnancy.

Dr. Frederick J. Lynch, Clerk,
Section of Obstetrics and Gynecology,
126 Massachusetts Avenue,
Boston, Massachusetts.

Dear Dr. Lynch:

The Obstetric column appearing in the *Boston Medical and Surgical Journal* of November 10, 1927, contains the statement with regard to the use of Pituitrin during pregnancy and labor which should not be passed by unchallenged. This is the statement that pituitrin may be used to start patients in labor, when indications arise in the last few weeks of pregnancy, or to induce labor in patients who are overdue and developing large babies. The method advised is a modification of the technique described by Watson with an ounce of castor oil given by mouth, followed at one hourly intervals by ten grains of quinine, a suds enema, and ten grains of quinine respectively; if labor does not start within twelve hours, pituitrin should be given intra-muscularly in 0.5 c.c. doses every half hour until labor starts or until six doses have been given.

This method is open to the two following objections, in so far as the use of pituitrin is concerned: Either it may have no effect, in which case no harm will have been done, or the pituitrin may cause prolonged and tempestuous uterine contractions with definite resulting danger to the mother from the possibility of uterine rupture, and to the baby from interference with the placental circulation. The writer has seen one such case in which the method was tried in a toxemic patient: Following the first injection of pituitrin, the uterus went into a prolonged tetanic contraction lasting over five minutes, while the fetal heart dropped to 60; full etherization was necessary to relax the uterus and allow the placental circulation to become effective again. Labor was eventually induced by insertion of a Voorhees bag.

It is not to be expected that the Obstetric column will contain statements with which its readers will agree at all times. Its statements, however, should err, if at all, on the side of conservatism, and of methods of tested efficacy. Watson's method can hardly be claimed to have given the results in the hands of others that the author himself claims for it, and it must, therefore, be looked upon as still unproved.

Yours truly,
THOS. R. GOETHALS.

In answer to this letter we wish to say, that the writer is perfectly correct in calling attention to his unfortunate experience in using pituitrin to induce labor.

The medical public used pituitrin freely and in improper doses when it first appeared and many occurrences of a nature similar to the one reported, happened. Practitioners were then informed and students were instructed never to use pituitrin except in the third stage. Gradually, as the preparation of the drug became standardized and its effects better known, the indication was advanced to the second stage in multiparous patients, with full cervical dilatation and no bony disproportion. Now, many obstetricians are even using it to stimulate labor in a lagging first stage and to induce labor. The dosage of 0.5 c.c. advocated by Watson, although used by him in a large number of cases without untoward result, does seem a little high and we prefer to use the drug in doses of 0.3 c.c.

It is true that an occasional patient will have an idiosyncrasy to a drug and react differently to it than other individuals, the same as is the case with morphia or scopolomine. The effect of pituitrin is evanescent and the action can be inhibited by the administration of ether or chloroform. It is not the contention of the advocates of the use of pituitrin that its employment for inducing labor is a one hundred per cent. harmless procedure, any more than are the other methods, viz., bagging, the introduction of bougies or the rupturing of the membranes, with their possibility of introducing infection.

The cases must be properly chosen and the procedure carried out under the observation of the attendant. If the uterine contractions become too strong or of a tetanic nature, the treatment above-mentioned should be administered. The use of the drug in a toxic patient, may cause some difficulty, for two reasons. First, because it raises the blood pressure. Second, the toxic uterus is apt to be "cranky" that is, the first stage pains occur irregularly and are of different intensity. It is with this condition that tetanic contraction of the uterus and separation of the placenta is most frequently associated. The patient with a borderline pelvis, in whom the question of the necessity of resorting to a Caesarian Section is present, and who has arrived at term, is the chief indication for its use, in our opinion. In this instance, it is desirable

to see what the case will do in labor. The ability of the baby's head to mold, the amount of "give" of the pelvic ligaments and the character of the uterine contractions are variable factors and can only be determined after the case is in actual labor. Any of the other methods of induction would preclude the possibility of a subsequent Caesarian Section.

The occasions for starting patients in labor are few and the cases should be carefully chosen. We do not wish to give the impression that the use of pituitrin to induce labor is an entirely harmless procedure. Also, we were not advocating its employment as *the* method of choice for inducing labor, but in discussing the purposes of pituitrin in obstetrics, called attention to the fact that this was one of its uses.

Questions of a similar nature to the foregoing will be discussed in the JOURNAL each week. They may be addressed to the Clerk of the Committee, in care of the JOURNAL and will be answered by members of the Committee of the Section of Obstetrics and Gynecology.

BOSTON MEDICAL LIBRARY

WILLIAM HARVEY (1578-1657)

THE medical world is very properly taking notice this year of the 300th anniversary of the publication of *"Exercitatio Quatomica de Motu Cordis et Sanguiness in Animalibus"*, Harvey's great work on the circulation. The significance of this work and at the same time the occasion for celebrating its tercentenary is the fact that it represented the beginnings not only of modern physiology but was one of the first examples of the application of scientific principles to the study of medicine. The authority of Galen, which had dominated medical thought for 1300 years was first seriously shaken and though Vesalius, Fabricius, Cervetus and Sylvius has made gestures to this end, no finished study had been published that was destined to so seriously influence subsequent thought as did this book of Harvey. Had not the influence of the Roman Church in Catholic countries and certain of the leaders in the Reformation in others exerted such a restraint upon scholarship it is probable that what Harvey is credited with having initiated might have had a somewhat earlier birth. In England opposition from such sources was not at this time so potent. Harvey was born near Folkstone, England in 1578. He was graduated from Caius College at Cambridge in 1597 and having decided to study medicine made his way to Padua the most renowned institution for the pursuit of medical studies at that time. Here he came under the instruction of Fabricius who was teaching anatomy there, certain of whose observations he was later to elaborate and perfect. From here he was given his diploma in medicine in 1602. He then returned to England where he started practice, was soon (1607) admitted to the College of Surgeons and by 1609 was occupying a position of some importance at St. Bartholomew's Hospital. He was widely read in the classics of medicine, was an admirer of Aristotle and Galen and quotes the former advising the study of comparative anatomy as a means of making clearer that of the human body. In 1615 he was chosen Lumleian lecturer at the College of Physicians and in April of 1616 he gave the first published expression in the form of lectures of his views on the circulation of the blood which however were not published in book form until 1628. His writings indicate that in the pursuit of his studies in anatomy he had dissected about eighty subjects. He had the work of Vesalius, Columbus, Fallopius and others at his fingers ends. He quotes Aristotle more frequently than any other author and after him Galen, for whom he apparently had professional respect without much personal admiration. His familiarity with Horace and Virgil among the Latin poets and with Caesar and Cicero was often shown. He had read St. Augustine and was well grounded in Bible study. In 1618 he was Physician Extraordinary to King James I with a promise of appointment to be Physician in ordinary at the next vacancy. His book on the circulation excited considerable discussion both at home and abroad but no where was there claim that any other was entitled to priority of discovery. He took trips abroad by order of the King, as physician to certain of the Royalty. He is said to have been present at the battle of Edgehill where he was in charge of the Prince of Wales and the Duke of York and sat on the side lines reading a book during the progress of the battle. He had a considerable practice, was very industrious in prosecuting his studies and achieved high position among the physicians of his day. He refused election to the presidency of the College of Surgeons on account of his age. He suffered much from the gout and it was during an attack of this malady that he died on June 3, 1657. He is buried in a memorial chapel at Hampstead Church, built by the College of Surgeons.

Such of his works as the Library possesses will be exhibited during the week of April 30th.

FRACTURES OF THE CARPAL SCAPHOID

In spite of the fact that there have been repeated warnings in medical literature to the effect that sprains of the wrist are frequently far more serious than they, at the first blush, appear the profession is singularly unmindful of these warnings either because personal experience has not enforced them or because familiarity with medical literature has been lacking. For this reason during the week of April 30th, there will be found on display in Holmes

Hall some of the more significant literature upon this subject. The last word has probably not been uttered in regard to this condition. It has not been determined why the scaphoid, of all the bones of the carpus, is the most frequently broken; why it is so loath to unite when it is, no matter what method of management is employed and what is the explanation of the occasional bipartite characters of its make up; none of these matters have ever been satisfactorily accounted for. The fact that there are apparently two centers of ossification in this bone quite frequently may be the answer to some, if not all, of these questions. The outstanding point that seems to need emphasis is that trauma to the wrist, however trivial, may result in a fracture and in making an examination of this region neglect to take this into consideration may result in embarrassment.

MISCELLANY

RÉSUMÉ OF COMMUNICABLE DISEASES IN MASSACHUSETTS

MARCH, 1928

GENERAL PREVALENCE

The total reported incidence of communicable diseases for March was very high, due principally to the prevalence of measles.

As was the case for February, the incidence of measles was by far the highest of any March in the history of the Department. There has been no evidence of a decline as yet. The incidence of mumps was rather high.

The reported incidence of diphtheria, scarlet fever, pulmonary tuberculosis, lobar pneumonia, German measles and whooping cough was within endemic limits.

In February a new low record for typhoid fever for that month was reported. Again in March a new low record has been reached. It is the lowest record for any month in any year. The incidence is 35 per cent. lower than the previous best March record, in 1926. The first quarter of the year shows a reduction of 20 per cent. from the previous low first quarter, in 1926.

Fewer cases of influenza were reported than in any previous March. The incidence of poliomyelitis was low.

RARE DISEASES

Actinomycosis was reported from Lynn, 1; total, 1.

Anterior poliomyelitis was reported from Boston, 1; Cambridge, 1; Hopkinton, 1; Somerville, 1; Wakefield, 1; total, 5.

Anthrax was reported from Haverhill, 1; total, 1.

Dog-bite requiring anti-rabic treatment was reported from Ashland, 1; Boston, 16; Braintree, 1; Chelmsford, 4; Hanson, 1; Lowell, 17; Lynn, 1; Mansfield, 1; Marblehead, 1; Newton, 3; North Attleboro, 1; Peabody, 1; Revere, 8; Southbridge, 3; Stoughton, 2; Waltham, 1; Winchester, 1; Winthrop, 4; Worcester, 6; total, 73.

Encephalitis lethargica was reported from Weymouth, 1; total, 1.

Epidemic cerebrospinal meningitis was reported from Adams, 1; Boston, 4; Easthampton, 1; Greenfield, 1; Lowell, 1; Northampton, 2; Somerville, 1; Springfield, 1; Worcester, 1; total, 13.

Pellagra was reported from Boston, 1; total, 1.

Septic sore throat was reported from Beverly, 1; Braintree, 1; Boston, 3; Cambridge, 5; Chelsea, 1; Lynn, 2; Plymouth, 1; Somerville, 1; total, 15.

Trachoma was reported from Boston, 4; Chelsea, 1; Fitchburg, 1; Worcester, 1; total, 7.

PROPOSED NATIONAL INSTITUTE OF HEALTH

Last year the Federal Government expended more than $13,000,000 in fighting plant diseases and pests; more than $8,000,000 in fighting the diseases of animals, and about $43,000 for the research department of the Public Health Service. In preparing an argument in favor of an intensive study into human diseases the Public Health Authorities estimate that

MONTHLY REPORT OF CERTAIN COMMUNICABLE DISEASES.

DISEASE	Cases in Entire Population				Case Rates per 100,000 Pop.		
	Mar. 1928	Mar. 1927	Prosodemic Index	Epidemic Index	Mar. 1928	Mar. 1927	Expected Rate***
ALL CAUSES	15,906	10,422	-	-	367.8	244.1	-
Ant. Poliomyelitis	5	3	12*	.4**	.1	.1	.3
Diphtheria	411	429	447*	.9**	9.5	10.0	10.3
Measles	8,227	1,297	4,234*	1.9**	190.2	30.4	97.9
Pneumonia, Lobar	617	563	688*	.9**	14.3	13.2	15.9
Scarlet Fever	1,408	2,517	1,324*	1.1**	32.6	59.0	30.6
Tuberculosis, Pul.	435	490	365*	1.2**	10.1	11.5	8.4
Typhoid Fever	13	44	20*	.7**	.3	1.0	.5
Whooping Cough	1,198	760	1,094*	1.2**	27.7	17.8	25.3
Chicken Pox	974	1,167	-	-	22.5	27.3	-
German Measles	111	68	-	-	2.6	1.6	-
Influenza	50	89	-	-	1.2	2.1	-
Mumps	1,496	2,027	-	-	34.6	47.5	-
Tuberculosis, O. F.	82	61	-	-	1.9	1.4	-

*This Index is an attempt to estimate the number of cases based on the trend during the past years which can be expected to occur, and is for the purpose of comparison with the number of cases which actually did occur.

**This ratio expresses how prevalent the disease is compared with the index mentioned above; 1.0 indicates that the actual number of cases equals the expected number. A larger number means a greater prevalence, and a smaller number a lesser prevalence than expected. Thus, 2.0 would indicate twice the expected number of cases, and .5 half the expected number of cases. The method used to determine the indices is described in the August 18, 1927 issue of the BOSTON MEDICAL AND SURGICAL JOURNAL.

***Calculated from the Prosodemic Index.

last year 50,000,000 people suffered from colds and bronchitis; 17,000,000 from influenza and grippe; 11,000,000 from diseases of the digestive system; 8,000,000 from tonsilitis and sore throat, and 5,000,000 from diseases of the nervous system.

A bill has been introduced in the Senate by Senator Ransdell of Louisiana providing for the creation of a National Institute of Health within the Public Health Service, carrying with it an appropriation of $2,000,000 a year for a term of five years.

MASSACHUSETTS LEGISLATIVE NOTES

HOUSE—NO. 1219

An Act enlarging the District to which Certain Laws relative to the Emission of Smoke shall apply, and providing for Further Investigation.

Be it enacted by the Senate and House of Representatives in General Court assembled, and by the authority of the same, as follows:

SECTION 1. Section one of chapter six hundred and fifty-one of the acts of nineteen hundred and ten, as amended by section one of chapter ten of the acts of nineteen hundred and eleven, is hereby further amended by striking out the third paragraph and inserting in place thereof the following:—

"District" means the district to which the provisions of this act shall apply, to wit:—That part of Boston harbor lying westerly of a line drawn from the southeastern point of Deer Island to the northeastern point of Long Island and the territory comprised within the cities and towns of Arlington, Belmont, Boston, Braintree, Brookline, Cambridge, Canton, Chelsea, Dedham, Everett, Lynn, Malden, Medford, Melrose, Milton, Needham, Newton, Quincy, Revere, Saugus, Somerville, Stoneham, Wakefield, Waltham, Watertown, Weymouth, Winchester, Winthrop and Woburn.

SECTION 2. The department of public utilities is hereby directed to further consider ways and means for more effectively abating the smoke nuisance in the district described in the preceding section so far as is consistent with the reasonable requirements of fuel consumers, and to make a report of its findings and recommendations to the general court together with drafts of such legislation, if any, as it recommends by filing the same with the clerk of the house of representatives not later than December first of the current year.

RECENT DEATHS

STEVENS—DR. GEORGE BECKWITH STEVENS, a retired Fellow of the Massachusetts Medical Society, a former practitioner of Roxbury, died at his home in West Roxbury, April 14, 1928, at the age of 82.

Dr. Stevens was born in Castine, Maine, October 4, 1845, the son of Joseph L. and Dorothy Little Stevens. After attending the schools of Castine he came to Boston with his parents and entered Harvard Medical School, where he received his M.D. in 1870, first serving as house officer at the Boston City Hospital. From 1871 to 1891 he practised in Gloucester, and then in Roxbury, moving to West Roxbury four years ago.

He was interested in genealogy and for 15 years had been historian general of the Society of Mayflower Descendants. He was a member of the Sons of the American Revolution and the Society of Colonial Wars. During the Civil War he served with the 141st Illinois infantry and was a member in later life of Thomas G. Stevenson Post 26, G. A. R.

He is survived by his widow, Mrs. Mary C. (Hills) Stevens; two daughters, Mrs. Seavey P. Swan of West Roxbury and Miss Dorothy L. Stevens of Amesbury, and a son, Paul Stevens of Amesbury.

CUMSTON—The death has been reported of DR. CHARLES GREENE CUMSTON at Geneva, Switzerland, April 13, 1928. Dr. Cumston, who has recently played such a prominent part abroad in the history of medicine, both as a writer and officer of societies having to do with that specialty, was, from 1894 to 1912, a practitioner and writer in Boston. In the latter year he moved to Geneva and had made that city his home since. He will be missed by a large circle of friends, both here and in Europe.

CORRESPONDENCE

PRIVATE CHARITABLE HOSPITALS AND THE BURDEN OF CHARITY

THERE is perhaps no field of human endeavor providing a personal service for human kind that requires a keener or more rigid discrimination than the administration of either public or private charity. The Greeks are still suspected of bearing gifts and the butler must keep watch for the unbidden guest. *Charity* appears a better term than *free service*, for the latter in these gasoline days often suggests the lurking place of that polite, smiling, impudent rascal designated "unearned profits."

In presenting the viewpoint of the trustees of the private community charity hospitals, the term *charity* is used without reproach, and the term *greed* not intended to apply to "hard-earned profits." The viewpoint is not intended to cover the administration of hospitals maintained by taxation, or charity hospitals connected with medical schools used for clinical teaching. There are considered some sixty or more hospitals, classed officially as private charitable corporations, that serve their respective communities adapted to care for the usual industrial accident cases needing hospital care. In the main, these hospitals are financed, equipped and maintained, not by the general public but by a few interested philanthropic individuals. The estimated cost of the modern hospital is from $4,000 to $6,000 per bed, equipment and furnishings extra. Its furnishings are often provided by small groups. The cost of buildings and equipment is not represented in the maintenance charge. Having a hospital home provided at a cost per bed equal to a family home a few years ago and often provided by free gifts, exemption from taxation is small return for the donors' generosity and the benefits shared by the whole community. There is much confusion as to the community hospital's mission and who bears the burden of its support.

Dr. Alfred Worcester, Henry K. Oliver Professor of Hygiene, Harvard University, who helped a generation ago with the inauguration of many hospitals in Massachusetts, expressed his opinion on the mission of community hospitals in his book "Small Hospitals," published in 1894. I have his authority to state that he holds the same opinion now. To quote

from page 57 and 58 he says "It is not the hospital's mission to ease the financial burdens of people" (Note the hospital treats the individual not the "general public") "let other charities do that." "The hospital's mission is to relieve and comfort the sick and suffering, to help all curative processes, and do this alike for rich and poor." Today there is a large class neither rich nor poor, but self-supporting, self-respecting, wage earning, to be served as well. "In order to do this for the poor, money must be solicited." "This is trust money given for an especial purpose." "Patients who can pay the cost of their service should certainly do so. Those who can only pay a part should pay what they can." There are others, relatives, friends or employers who may be obligated to pay a part, or even the whole cost. That this policy is practicable today is shown by the report of the Massachusetts General Hospital for 1926. For the house service proper the average cost was $5.87 daily, the average receipts from patients, including nurse, $2.31 daily, gratuity 60%. Patients were admitted as low as $1 per week; 295 at a rate of $.50 per day. It may encourage understanding to define charity as sharing the burdens of those unable to bear their burdens alone. The *extent* of the charity meted out is to be measured by the ability of the recipient to help himself, as well as by the extent of his needs. To quote the Commissioner of Public Welfare's report for 1925, page 2: "Public assistance is today more adequate than it has ever been. When public authorities give in a way to relieve the burden from relatives and friends, they give badly. When they give in a way to stimulate the help of these, they give well." This is more emphatically true of private charity. A summary of sixty community hospitals shows that those served formed three nearly equal groups; one group not being able to pay *anything* themselves; but having a part of their cost paid by the city, state or by friends or employers. The second group pay a part of the cost individually. The third group pay more than average cost, the total received from the entire hospital service being about two-thirds of the cost. In some hospital groups about three-fourths of the cost of maintenance is received. To be more concrete, a group of fourteen hospitals in South Middlesex District in 1926 was studied. There were 28,290 hospital patients treated at a per capita cost of $4.58 daily, a loss of $1.12 per day. Industrial accident cases were treated at a loss of 34%. Two-fifths of the loss was met by interest on endowments, three-fifths by annual subscriptions or contributions. There was in this group a deficit of nearly 2% of the cost to be divided among thirteen hospitals. This last could only be met by those tireless workers that comprise the "Ladies' Aid Societies" etc. Only comparatively few shoulder the burden. What the insurance companies failed to pay had to be met, not by the public as a whole, but by a few only and *how* few, only the few know.

Previous to the passage of the Workmen's Compensation Act the administration of charity in community hospitals throughout the State was a simple matter. Charity was administered with discrimination according to the needs and ability of the individual patient, the staff doctor contributing his services gladly for deserving cases. When the Act placed the burden of providing medical and hospital care on the insurance companies, the situation was changed by the introduction of public servitors for a *profit*. Instead of a team of local workers with no profit in sight, or anticipated, governed by local conditions and necessities, the stock companies, all of whom with one exception, were from other states, or with their home offices in Europe, claimed the right of charity rates and free medical care from the hospital trustees, as a necessary part of the hospital service. Instead of the patient seeking treatment bearing the burden of his injury as an individual, the insurer who became responsible for both hospital and medical care under the law and was paid for it, repudiated the one, and claimed charity rates for the other. This was not so simple, as the insurer claimed community rights in all hospitals. Charity and profits could not sleep amicably in one bed. Because some city lasses smiled when profits made advances profits, like many a sailor lad from across the sea, tried to annex sweet charity in every hospital. The trustees shook their heads, and the advisory medical committee was consulted. They seemed to think profits a *nice fellow*. He was such a spender too. For every dollar paid for the benefit of the injured worker, he collected $1.66⅔ in premiums, paying $.4165 for brokers' fees and the home office. Profits seemed to like charity so much it might be best to try companionate marriage for a while and see! This was about 1920. How does the situation stand today? It begins to look as if there would be no big or little profits following the union, for relations are strained. Some fifty hospitals have repudiated this union. The question has been raised: Is it legal to use endowed charity for the benefit of any profit-seeking interest? The Special Commission of 1926 (quoted in the March 22nd JOURNAL) said "Hospitals should not be forced to do charity in industrial cases, and the right to determine the obligation for free medical service by staff doctors, in their community hospitals, rests with the *hospital trustees*."

There are six large municipal hospitals supported wholly or in part by taxation, and six large charitable hospitals used for teaching purposes, all caring for industrial patients. Many of these care for patients from a wide area, not only from near Boston but often from distant New England places. These twelve hospitals care for over 100,000 patients yearly. The sixty hospitals previously mentioned care for about twice that number, but their clientele is more restricted and largely local. If any exceptions are taken to the assumptions made in the published ruling of the Accident Board relative to the perquisites and obligations of staff doctors in general, as they may apply to the municipal and teaching hospitals, there are plenty of staff doctors representing them to express such views. The larger group of sixty hospitals, in general caring for twice as many patients, have a limited interne service, when there is *any*. There are few large clinics suitable for teaching, or helpful for training specialists. It is the opinion of the writer that the assumptions quoted apply only in part, if at all, to staffs where the doctor on duty gives an equal amount of time, skill, personal attention, and responsibility, to that given in private practice generally. When he gives free service to charity patients, or to those who can pay only a less-than-cost rate, he has met his rightful obligations to the hospital and local community. The term "ward patient" no longer means a "charity patient." There are as many kinds of ward service as there are classifications for patients. Whenever the regulations of the hospital permit, and the patient is allowed to select his own physician, the fact that a staff doctor exercises the relationship and responsibility of a private physician, actually rendering the needed service per-

sonally, it is hard to understand the reasonableness of any quibble whether the doctor was chosen by the hospital, the patient, or the insurer. The doctor *does the work*, the *patient receives the benefit*, and the part of the insurer *is to pay a reasonable fee for adequate service*, under Sec. 30.

The principle of a *cost rate* for hospital service has been in operation in Ohio for some time, and since 1921 Connecticut has required by law that the insurer pay the hospital *cost rates*.

The writer has knowledge that in one of the larger municipal hospitals, Everett and other cities using this hospital for dependent patients, were charged a cost rate of $27.50 weekly in 1926, which was 30% larger than the $21 per week rate then allowed by the insurance companies for compensation cases. The difference saved by the insurers was over $6,000. Is the consuming public less able to pay this difference than the tax payers of these municipalities? Who bears this burden? Who reaps the profit? The paragraph in the ruling being considered, referring to the demand of the staff doctor for a reasonable fee for adequate service, attempts to discover a fallacy by ignoring at least one other fallacy. There is first the assumption that the insurer derives no profit from this free medical service, and that the proportionately small group composing the *supporting public* is identical with the consuming public on whom the burden should rest. When the stock insurance companies claim the business necessity of both charity rates from the hospital and free service from staff doctors, it is for them to demonstrate the necessity of a double ratio of expense compared with Mutual Massachusetts companies. See Report of Commissioner of Insurance for 1926, page 7. Also a ratio of expense many times in excess of the record of a monopolistic State fund. Information obtained from fifty per cent. of the charity hospitals serving the largest industrial cities and towns outside of Boston, supplemented by the report of the Boston City Hospital to the State for 1926, warrants the estimate that fully 8,000 industrial accidents are given hospital service $200,000 less than the average cost to the hospitals. If the free medical service was paid for at the rate now allowed for the same service outside the hospital, this present free medical service would total four times as much as the free hospital service, or a total of $1,000,000.

The Report of the Department of Public Welfare for 1926 records that the amount of annual subscriptions and contributions received by over 1,000 charitable corporations, was in excess of sixteen millions, which aided a current expenditure of over thirty-eight millions. No data has been recorded for the whole State which gives the ratio of individual givers to the whole public. Every one familiar with the difficulty of meeting the annual need of subscriptions knows that the ratio is small, yes, very small, and that but a small fraction of the consuming public is represented in the giving, charity-supporting public. It is reported that for several years, in a suburban city, two thousand individual subscribers (4% of the population) pledged themselves to meet an annual deficit of $30,000. The average local hospital returns to the community $1.00 in service for $.70 paid by those responsible for the service received. The Stock Insurance Company, for each dollar spent for the injured worker, collects in premiums $1.66⅔. As a general proposition the Stock Insurance company takes, as its toll, for doing the business more than double what it pays for both hospital and medical service. The hospital makes no profit; whether or not there is a profit, the insurance service is expensive.

In 1925 the Boston Chamber of Commerce collected information on the number of subscribers supporting 133 social agencies, under eight groups. The field covered included Metropolitan Boston with a population of 1,100,000. There were less than 44,000 contributors, or under 4% of the general public. Of the givers, 55.7% gave less than 3.2% of the whole amount collected. One per cent. of the givers, or one person to 2,500, formed a group contributing 50% of the amount collected. This ratio has been confirmed by the experience of professional promoters of drives for charity purposes. See Ref. "Financing of Social Agencies," pp. 33 and 34, 1925.

Both the Industrial Board and the Medical Advisory Committee, in presenting their viewpoint, give much stress to the *public* character of the hospitals caring for industrial cases, their public support and their duty to patients as members of the public. As the writer understands the situation, very few of the hospitals classified as private charitable corporations receive any substantial support through local taxation. There are a few municipal hospitals among the whole group considered, that receive some aid from local governments. The data published by the Department of Welfare discloses no such help to charity hospitals. As indicated above, the excess of cost above receipts from patients is met by charity. Do charity contributions from 4% of the people entitle the other 96% of the people to claim the right of an equal share in the charity given to aid those selected with discrimination? The trustees of charitable institutions have been taught to believe that the common law precludes the payments of public monies for the use of private charity except "*quid pro quo*."

General public support is obtained by taxation or by levy on articles of universal consumption. The latter ensures a wider distribution of the burden and is more easily borne. The writer understands the entire burden for caring for industrial accidents was intended to be placed on the consuming public.

Under the present act, is it fair to tax a citizen of Boston to provide a less-than-cost rate at the Boston City Hospital to provide treatment for a worker engaged in the manufacture of shoes, paid for by a citizen of Springfield, Chicago, San Francisco or by a stockholder of an insurance company from London? Is it any the less unfair to use yearly charity subscriptions for the same purpose? Is it conceivable that the law makers of the State foresaw that the charity funds of the State were to be applied to reduce hospital charges for the benefit of the far-reaching consuming public, or increase profits for the foreign stock companies? The trustees of charitable funds are guardians of its proper use. Would they do their duty to the local community and the donors of this charity, if they sanctioned this unnatural union of profits and charity longer?

The report of the Department of Public Welfare for 1926 gives the annual income available from endowed charity with annual contributions at $23,846,000. Under the State wide application of a less-than-cost rate for hospital service, tribute is levied on local communities for the benefit of the general consuming public, 96% of whom are non-contributing. Protests are accumulating from many widely separated hospitals serving industrial populations along the Merrimack, the Connecticut, and Narragansett

Bay. At least fifty hospitals classify patients protected by insurance as ineligible for charity service.

The accumulated facts indicate that most community hospitals are *public* institutions only in the sense that the hospital service offered the *public* is for a charge commensurate with the ability of the patient to pay the cost; that charity is extended the individual whose immediate need is greater than his own ability, or that of others obligated to meet the burden; that the charity extended is private charity contributed by less than 4% of the people; that public appeals for contributions are for *charity*, not *public* needs that no public or private seeking interests are eligible for charity service; that charity funds are properly extended by trustees only with discrimination; that the general public has no more claim on charity funds than an able-bodied man has to a living at public expense without work; that the present attempt to lighten the burden placed on the consuming public by the Compensation Act is without precedent in Massachusetts, and is "unjust and contrary to all economic principles."

Why are charity hospitals exempt from taxation except the State has set its seal of approval on charitable agencies, giving the trustees the right to control charities' proper use? The duty of trustees is to safeguard charity funds from the inroads of individual or corporate profit-seeking interests. However much sophistry may disguise the plea, the obligation to withhold charity is commensurate with obligation to extend it to the deserving.

GEORGE E. WHITEHILL, M.D., *Secretary*
Board of Management,
Whidden Memorial Hospital,
Everett, Massachusetts.

GROWING UP

The Commonwealth of Massachusetts,
Department of Public Health,
State House, Boston,
April 9, 1928.

Editor, NEW ENGLAND JOURNAL OF MEDICINE,

Recently I had the great pleasure of reading "Growing Up," by Carl Deschweinitz, published by MacMillan, which I understand in book form uses the method of biological instruction which the author used on his children. To my mind there is in society today no more pathetic individual than the parent who desires to do better by his or her children as far as biological instruction is concerned than was done by him but does not know how, when, where, etc. This particular book, which is small with large print and illustrated, seems to me to hit the nail square on the head. It will undoubtedly offend, but I think the offence will be to the inhibitive adults rather than to the children. It seems to me it would be worth while calling this to the attention of those in the State who would be glad of knowing of just such a book. I hasten to add that I have no arrangement with the author to share in the royalties.

Yours truly,
GEORGE H. BIGELOW, M.D.,
Commissioner of Public Health.

ALTERNATIVE TO VACCINATION

Mr. Editor:

As an alternative to vaccination for those who do not believe in it the following prescription of a naval captain given to me by a retired officer of high rank is I believe unique.

When American citizens were evacuated from Tampico, Mexico, by United States forces in 1915 it seems that a married couple who refused vaccination were taken from a home where smallpox was present.

Argument as to the desirability of protecting themselves and others by submitting to vaccination being as usual futile the captain ordered supervised daily baths of gasoline for the couple and these orders were carried out until the vessel disembarked its passengers at New Orleans several days later.

All martyrs for the faith did not perish under the persecution in Ancient Rome.

SAMUEL B. WOODWARD, M.D.

P. S. No smallpox developed en route. What happened afterwards is perhaps another story.

NEWS ITEMS

NEUROLOGICAL INSTITUTE OF NEW YORK—Two million dollars was asked to complete the Neurological Institute Building fund and establish a fund for medical research at a trustees' dinner given recently in honor of Robert Thome, President of the Institute. The Institute is now making a study of infantile paralysis, epilepsy and encephalitis lethargica, and an intensive pre-natal study is proposed.

INCREASE IN INFLUENZA AND PNEUMONIA DEATHS—Increases in the prevalence of smallpox and in the deaths from influenza and pneumonia, and decreases in typhoid fever, scarlet fever and diphtheria were indicated by the reports of State health officers for the week ending March 17, as compared with the corresponding week of 1927. Ninety-three cities reported 1,449 deaths from influenza and pneumonia for the 1928 week, as compared with 1,251 for the corresponding week of last year.

DR. ELMER F. OTIS WILL VISIT AND STUDY ABROAD—Dr. Elmer F. Otis of the staff of the New England Sanitarium and Hospital, Stoneham, Mass., retiring president of the New England Association for Physical Therapeutics, is on his way to Vienna, where he will engage in study. He is accompanied by his wife, Clara Beckner-Otis, M.D., also of the Sanitarium staff, who will also take special work.

THE ENGAGEMENT OF DR. JOHN M. FALLON AND MISS KATHLEEN E. McCANN—Dr. and Mrs. Daniel McCann of Bangor have announced the engagement of their daughter, Kathleen Elizabeth McCann, to Dr. John Michael Fallon of Worcester, only son of Dr. Michael F. Fallon, chief surgeon for many years at the St. Vincent Hospital in Worcester.

Miss McCann is a graduate of the College of the Sacred Heart in New York City, class of 1927, and is employed in the Bangor Public Library. Dr. Fallon is a graduate of Holy Cross College in the class of 1919 and the Harvard Medical School, class of 1923. He served his term as interne at the St. Vincent Hospital, Worcester, and at the Peter Bent Brigham Hospital, Boston. Subsequently he was recalled by Harvard to teach in the anatomy department of its Medical School and at present he is studying at the Mayo Clinic in Rochester, Minn.

THE STANDARDIZATION OF CLINICAL THERMOMETERS—A conference of manufacturers, distributors and organized users of clinical thermometers was held in Washington, March 30 ult.

New thermometers under the commercial standard will begin to be distributed next October.

Annual revision of the standard will be conducted by a committee representing the manufacturers.

LING MEDAL TO PROFESSOR WINSLOW—Professor C.-E. A. Winslow, Lauder professor of public health in the school of medicine at Yale University has been awarded the Ling medal by the Ling Foundation of Los Angeles. "in appreciation and recognition of Professor Winslow's active and unselfish work in behalf of the health progress of school children."—*Science.*

APPOINTMENT OF DR. DAVID STEARNS—Dr. David Stearns has been appointed to the position of resident physician to the Boston Homeopathic Hospital.

He succeeds Dr. Clifton T. Perkins. Dr. Stearns will continue to occupy the position of resident surgeon.

A GRANT FOR A RESEARCH FELLOWSHIP—Announcement has been made that the Maltbie Chemical Company of Newark, New Jersey, has contributed a grant for a research fellowship for the coming year to the Department of Chemistry of Princeton University.

The research work to be done under this fellowship will be fundamental in character and will cover certain phases of the chemistry of creosote and creosote compounds.

NOTICES

A LECTURE COURSE IN PHYSIOTHERAPY WITH PRACTICAL DEMONSTRATIONS OF ADVANCED TECHNIQUE

A Lecture Course in Physiotherapy with Practical Demonstrations of Advanced Technique will be given by Charles L. Ireland, M.D., formerly Chief of Physiotherapy, Walter Reed General Army Hospital, Washington, D. C.; U. S. Army General Hospital, Ft. McPherson, Ga.; U. S. Army General Hospital, Des Moines, Iowa; U. S. Army Base Hospital, Camp Grant, Rockford, Ill.; U. S. Veterans' Bureau, District Seven. including Ohio, Indiana and Kentucky, at Boston, Mass., May 7th to 12th, at 857 Boylston street. Synopsis of Lectures:

Monday, May 7, 8:00 P. M.: A physiologic concept of modern therapy, accompanied by motion pictures and lantern slides.

Tuesday, May 8, 10:00 A. M.: Galvanism. Properties of positive and negative poles, with their application in modern physiotherapy.

Tuesday, May 8, 4:00 P. M.: Sinusoidal Electricity, indications and use for slow, rapid and interrupted rapid sinusoidal currents.

Wednesday, May 9, 10:00 A. M.: Sinusoidal Electricity continued, with demonstrations.

Wednesday, May 9, 4:00 P. M.: Anatomy of the Autonomic, Sympathetic and Cerebral spinal Nervous Systems, with demonstration of applying low tension currents to nerve centers controlling all organs of the body.

Thursday, May 10, 10:00 A. M.: Properties of High Frequency Currents: A. Tesla, B. d'Arsonval, C. Oudin.

Thursday, May 10, 4:00 P. M.: Demonstration of application of high frequency currents. Diathermy for Pneumonia, Neuritis, Sciatica, Diabetes, etc.

Friday, May 11, 10:00 A. M.: Newer phases of quartz light irradiation in therapy: A., Basic principles; B., Technique for general body irradiation; C., Technique for localized irradiation in skin areas or orifices.

Friday, May 11, 4:00 P. M.: Quartz light therapy of Anemia, Rickets, Tuberculosis, and other malnutritive cases and the reason for its use.

Saturday, May 12, 10:00 A. M.: Scope and utilization of Infra-Red and Phototherapy or visible light therapy, and a resume of the week's work.

A physician may bring his technician with him if he desires, without additional charge. No technicians will be admitted to these lectures unless they are actually in the employ of a Doctor of Medicine and shall, in such cases, bring a letter from the employing physician.

For further information, address Secretary Ireland Lecture Course, 223 North California Avenue, Chicago, Illinois.

DR. WINSLOW TO GIVE CUTTER LECTURES

Dr. C. E. A. Winslow, Professor of Public Health at Yale University, has been appointed Cutter lecturer on preventive medicine for 1928-29 at Harvard University.

INTERNATIONAL SANITARY CONVENTION

The Senate on March 22, ratified the revision of the International Sanitary Convention signed at Paris on June 21, 1926. The original Convention was of the date of January 7, 1912.

More than 40 nations signed the revision in 1926; among the subjects dealt with in this treaty are: maritime quarantine, reporting of disease outbreaks, sanitary precautions in infected ports, and other matters dealing with the spread of diseases from one country to another.

BOSTON LYING-IN HOSPITAL

AN APPEAL

Boston, April, 1928.

1927, the ninety-fifth year of the hospital, saw more and better work accomplished than ever before. Since the hospital opened it has had over 100,000 patients and now about one-seventh of all the babies born in Boston are looked after by its staff. It is

only through the kindness of our many friends, to whom the Trustees are most grateful, that we are able to carry on, but we need enlarged donations if we are to avoid an annual deficit, which has been quite heavy in the past.

The hospital is overcrowded most of the time and we are frequently obliged to refuse applicants for lack of room. During the year we have had as many as 120 patients at one time, although the hospital is considered a one hundred bed institution.

The west wing is more than ever needed and it is expected that erection will be started in three or four months, as plans are practically completed.

During the past year 2,345 patients were admitted to the Hospital, 1,154 were attended in their homes and 17,644 visited the prenatal clinics. With the continued growth of the clinics it is felt that the proportion of strong healthy babies is greatly increased and that this branch of the work is very important to the whole community.

Contributions may be sent to James R. Hooper, Treasurer, No. 87 Milk Street, Boston, Mass.

WILLIAM L. RICHARDSON, M.D.,
President Emeritus.

Trustees: John L. Batchelder, President; James Lawrence, Vice-President; William D. Sohier, Secretary; James R. Hooper, Treasurer; Louis Bacon, William A. Coolidge, Charles E. Cotting, Courtenay Crocker, Charles P. Curtis, Mrs. Thomas B. Gannett, Roger Pierce, Walworth Pierce, William D. Sohier, Jr., Albert Thorndike.

Board of Lady Visitors: Mrs. Rodolphe L. Agassiz, Mrs. Francis I. Amory, Mrs. Harcourt Amory, Mrs. Edward L. Bigelow, Mrs. Henry Forbes Bigelow, Mrs. Gorham Brooks, Mrs. William H. Claflin, Jr., Mrs. T. Jefferson Coolidge, Mrs. T. Jefferson Coolidge, Jr., Mrs. Francis B. Crowninshield, Mrs. Philip Dexter, Mrs. Carl Dreyfus, Mrs. Marshal Fabyan, Mrs. Thomas B. Gannett, Chairman, Miss Adeline D. Hooper, Secretary, Mrs. Walter Hunnewell, Mrs. Jesse Koshland, Mrs. William E. Ladd, Mrs. Horace Morison, Mrs. Neal Rantoul, Miss Eleanor Sohier, Mrs. Bayard Warren, Mrs. Sinclair Weeks, Mrs. Edward C. Wheeler, Jr.

Honorary Members: Mrs. Charles H. Gibson, Mrs. Francis L. Higginson.

FIFTH INTERNATIONAL MEDICAL CONGRESS OF INDUSTRIAL ACCIDENTS AND OCCUPATIONAL DISEASES

The first official circular of the Fifth International Medical Congress of Industrial Accidents and Occupational Diseases, to be held September 2-8, 1928, in Budapest, Hungary, announces papers by the following physicians from the United States: Dr. Fred H. Albee, New York: "Traumatic Pseudo-Arthroses and Treatment by Automatic Machinery"; Dr. Emery R. Hayhurst, Columbus: "A Large Group of Silicotics with Very Low Incidence of Tuberculosis"; Dr. Eugene L. Fisk, New York: "The Periodic Health Examination in Industry"; Dr. Henry H. Kessler, Newark: "The Medico-Legal Aspects of Occupational Diseases"; Dr. R. H. Corwin, Pueblo: "Sanitation, Noise and Psychology in Industrial Hospitals"; Dr. Raphael Lewy, New York: "The Spinal Column in Reference to Trauma"; Dr. Richard Kovacs, New York: "Physical Therapy in Traumatic Conditions".

Titles for additional papers are still being received. Those related to Industrial Hygiene are to be sent to Dr. Emery R. Hayhurst, Joint Chairman, Columbus, Ohio, and those related to Industrial Accidents to Dr. Fred H. Albee, Joint Chairman, New York. June 1st is the latest date for the receipt of titles in Budapest.

Very extensive plans for scientific, social and scenic attractions in connection with the Congress are announced. The Hungarian Consul General of New York will grant free visé of passports to all visitors to the Congress and their families. A goodly number of participants have signed up for the Study Tour to the Congress, sailing on August 16th from New York on the S. S. "Munchen", visiting capitals and health resorts in Central Europe, and returning, after the Congress, via The Riviera and Spain, embarking from Gibraltar, on September 28th, for the return trip.

Physicians interested to join should communicate with Dr. Richard Kovacs, Secretary, 223 East Sixty-eighth Street, New York, from whom also any further information regarding the Congress can be obtained.

REPORTS AND NOTICES OF MEETINGS

THE HARVARD MEDICAL SOCIETY

The Harvard Medical Society held a meeting on Tuesday evening, March 27, 1928, at the Peter Bent Brigham Hospital. After the presentation of cases Dr. H. A. Christian introduced Sir Humphrey Rolleston, Regius Professor of Medicine at Cambridge University, and Physician in Chief, Pro tempore, at the P. B. Brigham Hospital. Sir Rolleston spoke on "The Clinical Significance of Abnormal Blood Pressure."

The first case was presented by Dr. Menard. The patient was a 43-year-old seamstress who came to the hospital because of weakness and nosebleed. Two of her sisters had died of high blood pressure. Her illness was of three years' duration and was characterized by headaches, nocturia, palpitation, and dyspnoea on exertion. She had spent seven weeks at the Boston City Hospital, and, while feeling better on discharge, the symptoms still remained. Epistaxis became marked and she noticed some edema of her ankles. On entrance to the hospital she was orthopneic and very weak. The heart was enlarged 15 cm. from the mid-sternal line, moderately fast, with a gallop rhythm and a systolic blow at the apex. The eye grounds showed marked tortuosity of the vessels with sclerosis and nicking of the veins. The liver was enlarged and tender, and there was some pitting edema of the extremities. Blood pressure was 220/110. The clinical pathology showed phthalein output of 10%, and N. P. N. retention. No diagnosis was given.

The second case was presented by Dr. Oljenick. The patient was a 24-year-old telephone operator who came into the hospital with a diagnosis of bilateral cervical ribs. She gave a history of transient numbness of the fingers, and pallor with weakness of her left hand when she had to raise her hands. No neurological symptoms were illicited and there was evident muscular atrophy of both arms and hands. Normal reactions to faradic and galvanic currents were obtained, and the plethysmograms were normal. Skin temperature tests were done and the following

results obtained: (a) a rapid loss of heat on the left side due to imperfect circulation; (b) a slowness of recovery of temperature in the extremity; (c) the dorsal surface of the hand recovers much more quickly than the palm. Dr. Christian pointed out that all of us on standing straight can obliterate the pulse and produce potentially the same changes.

Sir Humphrey Rolleston in the beginning of his lecture emphasized the fact that there are normal high or low blood pressures. After finding the blood pressure high, one must determine whether it is essential hypertension or hyperpiesia, or caused by arteriosclerosis, kidney or heart trouble. If none of these fit the case, we must decide whether to lower or raise the blood pressure, or give advice about wholesome living and dietetics.

To reduce high blood pressure often brings with it acute illness for the patient. This has led to the belief that a raised blood pressure is a compensatory adjustment. This belief has been disproved by first lowering the blood pressure with vaso-dilators, and noting if a compensatory increase occurred. Sir Clifford Allbutt suggested and upheld diathermy as a treatment for high blood pressure. As to prognosis, one cannot be definite. Many people live a long, happy and useful life with a blood pressure which on paper would be considered dangerous. Death from high blood pressure occurs in the order of their frequency from cardiac failure, uremia, cerebral hemorrhage. Which one will give way first depends on the inborn resistance, and on the presence of existing or acquired diseases such as arteriosclerosis. The symptoms of high blood pressure depend first on the cause of the blood pressure itself, and secondarily on the changes in the arteries, arterio-sclerosis, as a result of long-continued high blood pressure. It usually takes years for a high blood pressure to develop, but a form known as "malignant hypertension" is known which runs a very rapid course.

As regards a habitually low blood pressure, Sir Rolleston pointed out that 0.3% of people show a normal low blood pressure, which is often associated with longevity. It also occurs in athletes and has been investigated in Cambridge. The present conclusion is that no constant low blood pressure is attained in athletes. While a moderately low blood pressure is associated with perfect health, a decidedly low blood pressure gives definite signs and symptoms: lack of vigor, undue fatigability, and a tendency to faint; sensitivity to cold and palpitation.

Low blood pressure is due to a number of causes. It occurs in status lymphaticus. One other view is that essential hypotension is due to capillary stasis resulting from the excessive formation of histamine in the tissues. It also is found in habitual smokers. There are many diseases, pointed out by Sir Rolleston, which are characterized by a low blood pressure, the cause of which is unknown. In other cases such as in some heart lesions it is well compensated. In aortic regurgitation the blood pressure in the leg is much higher than in the arm, caused by the contraction of the capillaries to prevent cerebral anemia.

A change in blood pressure is associated with many clinical entities. It was found that the high blood pressure due to arteriosclerosis was almost invariably accompanied by arteriosclerosis of the arteries supplying the medulla. The explanation of increased systolic pressure to supply the distant brain centers is obvious. In renal disease a low blood pressure is found with an amyloid kidney, and in the later stages of cases which once had high systolic pressures. In acute nephritis only a moderate rise, if any, is found. Crises of high blood pressure of short duration occur, thought to be caused by the formation of histamine-like bodies in areas suffering with ischaemia. In acute lobar pneumonia the blood pressure varies, but some have found that the systolic pressure is higher in fatal cases than in those ending in recovery. In pulmonary tuberculosis a low blood pressure is not uncommon, but not diagnostic. In gastro-intestinal conditions, apart from those which produce severe pain, the blood pressure generally tends to be low. Rapid and complete thrombosis of the portal vein causes a sudden fall of blood pressure.

In brain conditions such as increased intracranial pressure, a rise greater than that in the cerebral vessels produces anemia and a compensatory rise in systemic blood pressure. In traumatic concussion the rise in blood pressure is quite slow, while in sudden compression such as hemorrhage, the rise is rapid. A very high pressure indicates a correspondingly large hemorrhage and the prognosis is grave.

In endocrine disorders the blood pressure varies greatly. In exophthalmic goitre it is usually raised, in the opinion of Sir Rolleston. A new syndrome of exophthalmic goitre and tumor of the adrenal cortex has been described in which a high blood pressure is found and the outlook far from encouraging. A hyper-secretion of adrenalin is another cause of high blood pressure. In connection with this a Russian surgon, Opal, ascribes this cause to that of Raynaud's disease, and recommends removal of one adrenal. In Addison's disease an extremely low blood pressure is the most essential feature.

The meeting was exceptionally well attended and of great interest.

THE WORCESTER DISTRICT MEDICAL SOCIETY

On April 11th the Worcester District Medical Society was entertained by Superintendent Dr. Harlan L. Paine, at the Grafton State Hospital, North Grafton, Mass. Dr. Winfred Overholser spoke on "Psychiatry and Massachusetts Criminal Law". Dr. E. H. Trowbridge showed the Liebel-Flarshein Cabinet, demonstrating the Electro-Surgical Knife in regard to "Metastasis of Cancer", and Dr. Frank E. Stowell spoke on "Physiotherapy in Rectal Diseases".

H. L. PAINE, Superintendent.

MEETING OF THE STAFF OF THE MASSACHUSETTS GENERAL HOSPITAL

A clinical meeting of the Staff of the Massachusetts General Hospital was held on Thursday, April 12. The program was given by the Neurological and Neuro-Surgical Services.

The first paper was delivered by Dr. S. Biddle, on the subject of pneumorachicentesis Dr. Biddle said that the introduction of air into the spinal cord by means of lumbar puncture had been in use now for a number of years, especially in Germany, where it has received more attention than it has in this country. This method, he said, often enables one to obtain pictures of the ventricles just as good as those obtained when air has been injected directly into the ventricles, and has the advantage of being a much simpler, and on the whole less dangerous, procedure. He described the technique in some detail, and showed

x-ray plates illustrating the results obtained. In the discussion, Dr. W. J. Mixter pointed out that the method was still in the experimental stage and that there was much to be learned from more accurate correlation of the x-ray pictures with the various types of pathology. Dr. G. Horrax said that in their experiments at the Peter Bent Brigham Hospital they had found this procedure particularly useful in visualizing the third ventricle: this was particularly valuable because there was often no other method of obtaining information as to this important structure.

Dr. C. A. McDonald next showed two cases of unusual ocular manifestations following encephalitis. Both of the patients were women who had had encephalitis a number of years ago. The ocular manifestations were quite different in the two cases: in one there was a spasm of the eyelids; in the other, an upward rotation of the eyeballs. Dr. McDonald said that within a comparatively short time he had seen some 12 cases in which ocular symptoms followed encephalitis. For treatment, hyoscine had been used with some success; during an attack it was often necessary for the patient to remain in bed in order to relax the spasm; sodium chloride tablets, given in gelatin capsules, were of some use in controlling the salivation which is often troublesome in this condition.

Dr. George Clymer described the local fat atrophy which sometimes follows insulin injections, and showed a patient with areas of marked atrophy of the fat and subcutaneous tissues of the upper arm. This unusual condition sometimes occurs after a relatively few insulin injections. Dr. Clymer's interest in the subject arose from the study of a case in which the lesion was supposed to be due to some neurological disturbance.

The use of chlorylen therapy in trigeminal neuralgia, tics and migraine, was discussed by Dr. Jacques DeBusscher. He told first of the interesting manner in which this drug was discovered: it was found that certain workmen engaged in doping the wings of aeroplanes with a mixture containing trichloraealylen, were poisoned, and that among their symptoms they showed anaesthesia over the distribution of the 5th nerve. It occurred to Oppenheim that the extraordinary specificity of this poison might make it useful in the treatment of certain painful affections of the 5th nerve. It has been tried out extensively in Germany, under the trade name of "chlorylen," and more recently in France. Dr. DeBusscher spoke of his experience with it in the clinic here, and said he had come to the conclusion that it was of great benefit in trigeminal neuralgia and occasionally beneficial in certain tics of the facial nerve; but that its use in migraine was disappointing. He pointed out that the drug was dangerous and had to be handled with great care: it is capable of producing extensive necrosis of the mucous membranes, as well as severe systemic symptoms. If, however, the inhalations are taken with proper precautions, from amounts not exceeding 20 drops, no ill effects occur. In the discussion, Dr. J. H. Means said that chlorylen had a field of usefulness in certain cases of trigeminal neuralgia which were not completely relieved by operation; he also stressed the fact that it is a drug to be treated with the greatest respect because it is potentially very dangerous. Dr. Horrax said that his experience with the drug had been favorable in certain selected cases.

Dr. J. S. Hodgson next spoke on the subject of cordotomy. While this operation, he said, has been practised for some time, it owes its present standing largely to the researches of Dr. Fraser of Philadelphia. Dr. Hodgson showed slides illustrating the anatomy of the spinal cord and the steps in the operation. The general aim of the operation is the division of the anterior lateral bundles which carry most of the pain fibres. Dr. Hodgson said that the operation was not technically difficult, but that no didactic rules could be laid down for the depth of the cut into the cord, this being a matter of individual judgment and experience. He said that this operation had a distinct field of usefulness in cases suffering from severe pain arising from the lower portion of the body and not easily controlled by drugs; and mentioned its use in the following conditions: metastatic or primary malignancy of the spinal column; malignancy of the pelvis; and the gastric crises of tabes. In discussion, Dr. Ayer spoke chiefly of its use in tabetic crises: he had seen a number of patients, operated upon by different neurological surgeons, and in the great majority of cases the results had been highly gratifying. He suggested that the failures in certain instances might be due to the fact that the section had not been made at a sufficiently high level. Drs. Mixter and Horrax told of their experience with the operation, which was very favorable in properly selected cases.

Dr. W. J. Mixter discussed his experience with the treatment of angina pectoris by alcohol injections of the upper thoracic sympathetic chain. These injections are made in the dorsal-thoracic region, a short distance lateral to the spinal column; about 5 needles are inserted, in accordance with a technique which he described in some detail, and a preliminary injection with novocaine is made; after waiting a short time, alcohol is injected. The procedure is very much simpler than operations upon the cervical sympathetic ganglions, and the danger is less. Dr. Mixter thought that the relief from pain was at least as good as that obtained by the more radical procedures. The method has the disadvantage that it has to be repeated from time to time.

Dr. H. C. Solomon, the last speaker of the evening, discussed the use of tryparsamide and malaria in the treatment of neuro-syphilis. He said that it was difficult to generalize about the results of treatment of neuro-syphilis, because the pathological picture showed such marked variations. In discussing the treatment of general paresis, he divided the cases into two groups: a group of late cases, in which the most that could be hoped for was an arrest of the disease; and a group of early cases, in which striking improvement was very frequently obtained. The modern method of treatment consists of the use of both tryparsamide and malaria: neither is used to the exclusion of the other, both having a very definite place in therapeutics. Dr. Solomon said he wished to stress the importance of early diagnosis. In the older days, when so little could be done in the way of treatment, it seemed rather futile to insist on an early diagnosis; but with modern methods, early diagnosis might well mean cure of the disease.

This meeting concludes the Staff Meetings for this winter. The next meeting will be held in October.

MIDDLESEX SOUTH DISTRICT MEDICAL SOCIETY

The Middlesex South District Medical Society held its Annual Meeting on Wednesday, April 18th, at the Commander Hotel, Cambridge.

The annual oration was delivered by Dr. Walter

B. Cannon. Subject: "Reasons for Optimism in the Care of the Sick."

John M. Birnie, President of the Massachusetts Medical Society was present at the meeting and gave a short address.

Dinner was served at 1 P. M. The meeting was attended by 155 members.

A more complete report of this meeting will appear in our next issue.

BRISTOL SO. DISTRICT, THE MASSACHUSETTS MEDICAL SOCIETY

SPECIAL MEETING

A special meeting will be held in the New Bedford Public Library, Friday evening, April 27, at 8:30 P. M.

This meeting is called for the purpose of "Cancer Week Observance," and Dr. Ernest M. Daland, of the Staff of the Huntington Memorial Hospital, Boston, will speak upon the subject of Cancer, as it interests the Medical Profession.

GEORGE C. BORDEN, *Secretary.*

ESSEX NORTH DISTRICT MEDICAL SOCIETY

By invitation, the Eighty-Seventh Annual meeting will be held at Haverhill Country Club, Brickett Hill, Gale street, Haverhill (telephone 1332) Wednesday, May 2.

Attention, Golfers: You are cordially invited to try your skill. This course has a good reputation and is 18 holes. Come early and bring your sticks. The tennis court extends a welcome also. Business meeting 12 m. sharp.

Dinner, 1 p. m. sharp.

These speakers follow the dinner:

1. "Recent Advances in Neurology," Henry R. Viets, M.D., of Boston, Instructor in Neurology in Harvard University Medical School (30 minutes). This will be discussed by Elmer S. Bagnall, M.D., of Groveland.

2. "Treatment of Fractures of the Long Bones," Arthur W. Allen, M.D., of Boston, Instructor in Surgery at Harvard University Medical School (with lantern slides) (30 minutes).

3. James S. Stone, M.D., of Boston, Executive Secretary to the President of the Massachusetts Medical Society, will speak on the "House Fund," i. e. the plan to purchase, by subscription, a building, as a permanent home for the State Society, to accommodate all its activities. Discussion on above matters is invited. (5 minutes).

The Golf Club is yours for the day. Make it a real day and *come early.*

Note: Follow north on Main street from Haverhill City Hall, to Walnut square, turn right on North Avenue to Gile Street to Brickett Hill. Distance from City Hall is 2½ miles.

Meeting of Censors will be held at Hotel Bartlett, 95 Main Street, Haverhill (tel. 3430) on Thursday, May 3, at 2 P. M. sharp. Candidates should present diplomas to the Secretary one week in advance.

ADELBERT M. HUBBELL, M.D., *President.*
J. FORREST BURNHAM, M.D., *Secretary,*
567 Haverhill St., Lawrence, Mass.

April 19, 1928.

CENSORS MEETING FOR THE MIDDLESEX SOUTH DISTRICT

The Censors for the Middlesex South District will meet to examine candidates for Fellowship on Thursday, May 3rd, at the Colonial Club, 20 Quincy Street, Cambridge, at 4 P. M.

Prospective members should present their applications to the Secretary and show evidence of graduation from a medical school at least one week before the meeting of the censors.

S. M. BIDDLE, M.D., *Sec.*
885 Massachusetts Avenue,
Cambridge, Mass.

SOCIETY MEETINGS

April 26—Massachusetts Association of Boards of Health. For detailed notice see page 472.

April 26, 27, and 28—Fifteenth Reunion of the Peter Bent Brigham Hospital Alumni. Complete notice appears on page 475, issue of April 19.

April 30—Annual Meeting of the Massachusetts Tuberculosis League. For complete notice see page 471, issue of April 19.

May 1-2—American Climatological and Clinical Association. See page 474, issue of April 19, for complete notice.

May 10-11—Conference on Rheumatic Diseases. Detailed notice appears on page 472, issue of April 19.

June 18-20—Meeting of the American Association for the Study of Goiter. See page 425, issue of April 12, for complete notice.

June 18-22—Convention of the Catholic Hospital Association. Complete notice appears on page 1597, issue of February 16.

DISTRICT MEDICAL SOCIETIES

Bristol South District Medical Society

April 27—Detailed notice appears elsewhere on this page.

Essex North District Medical Society

May 2, 1928 (Wednesday)—Annual meeting at Haverhill, 12:30 P. M., at the Haverhill Country Club, Brickett Hill, Gile Street, Haverhill. Complete notice elsewhere on this page.

May 3, 1928 (Thursday)—Censors meet for examination of candidates at Hotel Bartlett, 95 Main Street, Haverhill, at 2 P. M. Candidates should apply to the Secretary, J. Forrest Burnham, M.D., 567 Haverhill Street, Lawrence, at least one week prior.

Essex South District Medical Society

May 3 (Thursday)—Censors meet at Salem Hospital for the examination of candidates at 3:30 P. M. Candidates should apply to the Secretary, Dr. R. E. Stone, Beverly, at least one week prior.

May 8 (Tuesday)—Annual meeting. Detailed notice appears on page 1437, issue of January 26.

Middlesex South District Medical Society

May 3—Censors' meeting. Detailed notice appears above.

Norfolk District Medical Society

May 3—Censors' meeting. Roxbury Masonic Temple, 4 P. M. Applications will be mailed by the Secretary upon request. Detailed notice appears on page 271, issue of March 22.

May 8—Annual meeting. Details to be announced.

Suffolk District Medical Society

April 27—Special meeting. Detailed notice appears on page 471, issue of April 19.

May 3—Censors' Meeting.

The Censors of the Suffolk District Medical Society will meet for the examination of candidates at the Medical Library, No. 8 The Fenway, Thursday, May 3, 1928, at 4 o'clock.

Candidates should make personal application to the Secretary, and present their medical diploma at least one week before the examination.

ARTHUR H. CROSBIE, M.D., Secretary.
520 Commonwealth Avenue, Boston.

Notices of meetings must reach the JOURNAL office on the Friday preceding the date of issue in which they are to appear.

BOOK REVIEWS

The Mechanics of the Digestive Tract: An Introduction to Gastroenterology. By WALTER C. ALVAREZ, M.D. Second Edition. New York, 1928. Paul B. Hoeber, Inc. Pages, 447. Illustrations, 100.

The first edition of this book developed as an elaboration and an amplification of a lecture given in 1920 before the American Roentgen Ray Society. In the book preface, the author stated that "in 1913, while doing some work on the absorption of gases injected into loops of intestine, I noticed differences in irritability in different parts of the bowel; that is, the jejunum reacted actively to distention, while the ileum generally responded but little. It promptly occurred to me that this graded difference in irritability might account for the downward progress of food in the bowel, because it seemed reasonable to suppose that material would have to move from the more irritable and active regions to the less irritable and active ones. While attempting to show these differences in irritability with excised segments of intestine, I found that the rate of rhythmic contraction of the muscle is graded downward from the pylorus to the ileocecal sphincter. Remembering how much the heart specialist has profited by the careful study of conduction along a similar rhythmic gradient from the sinus node to the ventricle, I was filled with the hope that a careful analysis of the gradient found in the bowel might throw light on the mechanism of peristalsis and might put more system into the science of gastroenterology."

"It was found that the idea of a gradient of forces which can be flattened or reversed offers the best, the simplest, and often the only explanation for many of the phenomena observed by the physiologist, the internist, the roentgenologist and the surgeon."

The author realized however that he must "in all fairness to my readers, emphasize the fact that much of what is written in Chapters IX and X is purely suggestive". Viewed thus, and read with possible reservations and an open mind, the stimulating contents of this book should be familiar to all who have occasion to work at all in the field of gastroenterology, and there are few who do not.

In the preface to this second edition, the author states that "this is practically a new book in plan and scope. The first edition was little more than a detailed statement of the gradient theory with its bearing on the problems of gastroenterology; this one represents a determined effort to make readily available to thoughtful practitioners such information about the mechanics of the digestive tract as they need daily in their struggles to improve their diagnostic and therapeutic technic."

The author considers that "the bibliography of the present volume, containing 900 titles, is probably the best part of the book". One notes with mild regret and some surprise, the complete absence from this extensive bibliography, of any titles by such well-known workers in gastroenterology as for example, R. Walter Mills. The author however states that the literature is now so enormous that even a fast reader can hardly keep up with it; "and from those whose good work I have slighted I can only beg forgiveness, and a reprint".

The author draws an interesting comparison between progress in gastroenterology, and progress in cardiology. He then asks the question: "Are we in gastroenterology any more awake today than were the cardiologists in 1900, that is, better prepared to recognize promptly the importance of epoch-making papers published in journals devoted to physiology and anatomy?" To this, he replies, "I hope we are, and I think it augurs well for the future that more and more books are now appearing in which the results of research in special fields are so well epitomized and reviewed as to make them readily available for use by practitioners of medicine."

"It may be of interest to note that in the five years since the appearance of the first edition of this work the idea of a gradient of activity down the intestine has received considerable support from workers in various parts of the world, and a number of my early observations have been confirmed. The whole gradient idea has been strengthened by the work of Murray, who has shown that even in tissue cultures, muscle cells from the embryonic auricle will beat many times faster than will those from the ventricle. This must mean, as Dr. Child and I have always felt, that the gradients are not due purely to functional adaptation during life, but that they are basic, and built into the very structures and chemical composition of the individual cells."

"If the downward gradient is of any value to us in health, it follows as a collary that upsets in it should produce the symptoms of disease. As will be seen later, such upsets have been observed in animals and it is highly suggestive that most of these animals were sickly; some of them were refusing food, and others were even vomiting. The main question then before us is: are these upsets ever present in the digestive troubles of man, and if so, are they responsible for the disturbances in motility which are then observed?"

"Unfortunately, these questions cannot yet be answered with certainty. Other factors may easily be more important in some cases. On account of these gaps in our knowledge much of what follows must of necessity be purely theoretical or based on analogy. It seems to me however, that so long as the reader will keep separate in his mind that which is proved and that which is merely suggested, it can do no harm to set forth in a logical manner the various ways in which the gradient might theoretically be upset, and the ways in which such upsets might affect the motility of the tract."

"Some may ask: in which way can the idea of a gradient altered by disease influence our methods of treatment? The answer is that so far little has been done because therapeutists have not been thinking along these lines. Later we may be able to get drugs which will help in restoring the normal gradient, perhaps as calomel does, but without unpleasant by-effects. In the meantime there is a diet which is very helpful, probably because it does not lead to conflicts with disordered gradients."

At the close of his chapter entitled "Practical Applications of the Gradient Idea", the author sets forth in detail, the "smooth diet" which he has found helpful.

Unquestionably, one of the best places to study functional activities of the living human intestine and colon, is in the dark room, before the fluoroscope. A more extensive familiarity with the extraordinary diversity of action which is displayed by the human colon as seen before the fluoroscope, might well have suggested alterations in some of the statements made

by the author with regard to the habits of the ileocecal sphincter, and the colon. Fluoroscopic observation of the colon extending over a period of some fifteen years, would for example make it possible for the reviewer himself to point out one or two alterations which might to advantage be made in the text.

The reviewer, however, is not minded to find fault. On the contrary, he takes pleasure in unreservedly recommending this book to thoughtful students of medicine, for firstly, it contains a very large amount of mental pabulum which deserves adequate mental mastication, digestion, and absorption. Secondly, no intelligent person can read it without being stimulated in the direction of inductive thinking; and from this point of view alone, the book is worth while.

Gastroenterologists may well offer up a prayer that more patients may become convinced of the logic of the author's quotation from Josh Billings to the effect that: "I hav finally kum to the konklusion that a good reliable sett ov bowels iz wurth more tu a man than enny quantity ov brains".

Asthma, Its Diagnosis and Treatment. By WILLIAM S. THOMAS, M.D. Paul B. Hoeber, Inc., New York.

Although the "aim to make this book a practical guide to the management of asthma patients", the volume is only partly successful. There is little said about present day problems concerning the etiology and mechanism of allergy and many clinical aspects are omitted, so that the book is of little value for reference. History taking is described and given some prominence, but the lack of good case reports to illustrate the method is unfortunate.

Skin tests are described in detail and the list of test substances, presented without discussion and without any classification of the patients, gives the impression that most patients react to them. The list of plant pollens is long, but is not analyzed as to the relative importance of one plant over another.

The best chapter is devoted to the use of vaccines and here we do find a few case reports and a statement of end results to indicate the prognosis in this particular series.

The list of 325 references arranged alphabetically at the end of the book is of real value in itself, but its effectiveness is immensely curtailed by the deliberate omission ("to avoid confusion") of numbers after authors' names or after text clauses which might indicate the correct reference.

The printing is on heavy shiny paper, and the binding is poor. The 233 pages of text are padded with fifty blank pages.

The Hebrew Physician (Harofeh Holvree). Dr. MOSES EINHORN and DR. ASHER GOLDENSTEIN, Editors. Volume 1, Number 1. New York City. January, 1928.

The first number of *The Hebrew Physician (Harofeh Holvree)*, a medical journal in Hebrew, appeared in January, 1928. It is the publication of a group of physicians in New York to whom the Hebrew language has never ceased to be a living language. It is the only medical journal published in Hebrew outside of Palestine, though the projectors speak of similar groups of Hebrew-speaking physicians elsewhere who are planning a similar effort in their respective countries.

Following are some of the matters treated in this volume: The question of Hebrew medical terminology; polycystic kidney; a new duodenal tube and its use; the sequelae of osteo-myelitis; whooping cough; correlation between physical and X-ray findings in some pulmonary disease; acute hemorrhagic pancreatitis; book reviews; bibliography (tuberculosis among Jews). Some of the papers are illustrated and at the end there is a Hebrew-English medical vocabulary.

This venture in medical journalism is certainly interesting. It is, however, not unique for there have been medical publications in foreign languages in this country before. It is a manifestation of the hold which the renaissance in Jewish culture is having upon Jewish people throughout the world. How many numbers will this publication live?

The Medical Department of the United States Army in the World War. Volume VII, Training. pp. 1211. In two sections. Part I, Training in the United States. Part II, Training in the American Expeditionary Forces.

In the brief introduction to this, the seventh volume of the World War series, we are told that when the United States entered the war the army medical personnel was not enough even for a skeleton force to take in and assimilate the great number of physicians needed to adequately care for the millions that were to be mobilized and intensively trained for their work abroad. In the first part of the book the history and workings of the great training camps in this country is given. Many illustrations pertaining to camp sanitation add interest to this section. The reader, as he follows the different chapters, is made to see the physician's gradual change from his civilian environment, as he becomes *au fait* with all that concerns the military branch of his art.

The second part of the volume, dealing with the training over seas, is no less interesting; naturally the subject matter is so great that it is impossible to speak of this in any but general terms. Those sections of this part of the work dealing with the instruction concerning fractures, wound bacteriology, the modern treatment of war wounds and the history and training of the resuscitation teams and their transfusion work, which accomplished so much, are of particular interest.

This volume of the World War series should be read by all who wish to learn what the Medical Department of the Army accomplished in a brief time, turning city specialist and country practitioner alike into the army medical officers of which this country is so justly proud.

Mechanics and Chemistry of Human Body. By O. BOTO SCHELLBURG. Schellburg Institute, Inc., New York City, 1928. pp. 50.

This small book describes the physiology of the colon, the biology of the cell and the technique of colonic irrigation. The opinions given on these subjects are largely the result of the author's experience, as references are not given. One section, on the application of colonic therapy in internal medicine, is written by H. W. Rothman. Several roentgenograms of the colon at varying periods after the injection of a barium enema are shown.